

FKM_LFSA_v01 – Status quo of the demo-version

Jan Papuga - January 8, 2014

Key data

- The solver aims at fatigue strength assessment using local stresses.
- It implements Analytical Strength Assessment published by Forschungskuratorium Maschinenbau (FKM), 5th edition [1].
- It is built as an application under Visual Basic for Application within MS Excel. It therefore requires a valid license of MS Excel to be installed on the computer, where it is intended to be run. The program will not run properly, unless you enable running of VB scripts within MS Excel.
- It was developed within FADOFF project by Evektor, spol. s r.o. (www.evektor.cz) with the financial support of the Technology Agency of the Czech Republic.
- The application is released on January 8, 2014 with period of the use limited till January 31, 2014. Extensions of the license period can be prepared on demand – contact Jan Papuga (papuga@pragtic.com).
- Though this is a file with VB scripts, no data about or from the users are collected.
- The program is only a demo-version, and the providers are not liable for any losses caused by its use for any analyses.

Limitations, known issues

- It was tested on MS Excel 2000 and 2010. Other versions can result in strange behaviour. We will be glad for any beta-testing on such versions.
- It cannot calculate the stress gradient from the finite element mesh, though it enables computations at more points/nodes.
- The material database doesn't involve data provided by FKM in the aforementioned book [1]. The file material.xls in the installation zip is only a template, where your data have to be added either directly or through the program interface. The program will not run properly, if this material database is not saved in the same directory as the FKM_LFSA application.
- The current version has manual written only in the Czech language [2] (a part of the downloaded zip), and a release of the manual in another language version is not expected (see the section Next steps). Possession of the original book [1] is therefore recommended to help in orienting. The interface to program is otherwise in English.
- Due to the fact, that the solution of the variable amplitude loading with variable mean stresses is not adequately described in the 5th edition of [1], this part of the solution follows the procedure provided in the 6th edition [3].

Next step

- The current program is a testing version intended for a further research of FKM guide capabilities. It also will serve as the basic input for implementing the solution into the PragTic fatigue solver interface (see www.pragtic.com).

References

- [1] FKM-Guideline - Analytical Strength Assessment of Components in Mechanical Engineering. 5th revised edition. Forschungskuratorium Maschinenbau, Eds. VDMA Verlag GmbH, Frankfurt/Main 2003.
- [2] Tománek, J.: Help for FKM Guideline in Visual Basic for Application in MS Office Excel. [Technical Report FAD/12/004, ver.A]. Eektor spol. s r.o., Kunovice 2013.
- [3] FKM-Guideline – Rechnerischer Festigkeitsnachweis für Maschinenbauteile aus Stahl, Eisenguss- und Aluminiumwerkstoffen. 6. überarbeitete Ausgabe. Forschungskuratorium Maschinenbau, Eds. VDMA Verlag GmbH, Frankfurt/Main 2012.