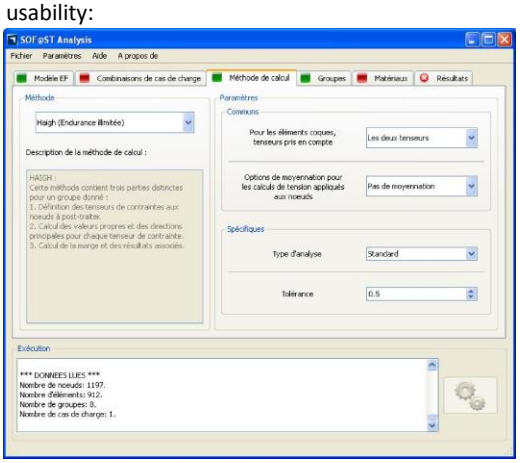
SOFAST @nalysis : SOftware for FAtigue STrength analysis

Version v1.8

DESCRIPTION :

SOFAST @nalysis software is dedicated to perform quickly and easily fatigue analysis. The calculation method available with SOFAST @nalysis was defined according to the criterias of performance, robustness and usability:



- A Graphical User Interface easy to use and intuitive,
- Interfaces with the standard output files of the main Finite Element Analysis software,
- No need of specific data to perform fatigue analysis,
- Efficient, robust and reliable calculations for a quick diagnosis of the fatigue resistance,
- Export the results to the native output formats of the main Finite Element Analysis software,
- Batch calculations.

ALGORITHM:

Based on usual fatigue analysis methods (Haigh, Dang Van, Goodman-Wöhler, Manson-Coffin), SOFAST @nalysis implements original technics of calculations, as example, the calculation of pseudo-stress tensor based on the detection of the largest principal stress or the temperature wich is taken into account in the damage calculation. This methodology optimizes the best calculation times while maintaining good precision for multi-axial stress analysis.

COMPATIBILITY :

SOFAST @nalysis is interfaced with ABAQUS, NASTRAN and ANSYS, and supports the elements below:

FEA Software	Versions	Type of elements		
		Shell	Membrane	Volume
ABAQUS	Versions 6.12 to 6.14	S4, S4R, S3, S3R	M3D6	C3D8, C3D8I, C3D8R, C3D6, C3D10, C3D10M
MSC NASTRAN (1)	Versions 2008r1 and higher	CQUAD4, CQUADR, CTRIA3, CTRIAR	CTRIA6	CHEXA (linear), CPENTA (linear), CTETRA (parabolic)
ANSYS	Versions 12.1, 13, 14.5, 15.0 & 16.0	SHELL181, element with 3 and 4 nodes	SHELL281 Keyopt=1, element with 6 nodes	SOLID185 element with 6 and 8 nodes, SOLID187

(1) OP2 file format compatible with NX Nastran and Optistruct

SUPPORTED HARDWARE AND OPERATING SYSTEMS:

SOFAST @nalysis is running on WINDOWS 64-bit (XP, VISTA, 7 and Windows Server) and can be installed either on local computer (node lock license) or an application server for network (floating license).

PREREQUISITES :

SOFAST @nalysis uses the following system configurations according to the type of installation:

Minimal configuration [recommended]	Node lock License	Floating license	
	Local workstation	Client workstation	Server
OS	Windows XP sp1 and higher	Windows XP sp1 and higher	Windows Server 2003 and higher
API ODB / ABAQUS [2]	Yes	No	Yes
API RST / ANSYS [2]	Yes	No	Yes
RAM	2 Gb [4 Gb [3]]	2 Gb [4 Gb [3]]	/
Disk size for installation	200 Mb	/	200 Mb

[2] API used to import/export ABAQUS / ANSYS results files. Install the API version relative to the ABAQUS / ANSYS version to use (see ABAQUS / ANSYS documentation).

[3] Values recommended for analysis of models higher than 5.000.000 of DOFs.

LICENSE :

The license is based on the combination of input formats and calculation methods, so the users can chose only the features corresponding to strictly to their needs. For an installation on a server, the accesses are limited to the geographic site on which the server is located and the authorized number of concurent access is pre-determined by the customer.

SOFAST @nalysis is decomposed into fonctional and autonomus modules and can be activated according to the customer's needs. The module for the TXT input format is free for all configurations. All calculation methods take into account the temperature influence (currently, feature available only with ABAQUS).

Module: Input formats	Import	Export
TXT (EXCEL or text editor)	NA	Yes
ODB (ABAQUS)	Yes	Yes
OP2 (MSC and NX NASTRAN, Optistruct)	Yes	Yes
RST (ANSYS)	Yes	Yes
Others	[4]	[4]

Module: Calculation methods	Secondary modules
HAIGH	
DANG VAN	
GOODMAN-WOHLER	
MANSON-COFFIN [5]	BASQUIN, Smith-Watson-Topper, Morrow
Others [4]	

[4] Future versions

[5] Only with ABAQUS

To run SOFAST @nalysis, the minimal configuration imposes to select at least one module for the input format and one module for the calculation method.