

## Documentation



# *Interface LIMIT* – SolidWorks



# Interface LIMIT – SolidWorks

### **Supported SolidWorks Version in Release Package**

- **SWX 2014**, SWX 2015
- SWX 2016 + Service Pack 05 or later!
- + SWX 2017
- **SWX 2018**
- + SWX 2019
- If you need a different version please contact LIMIT support (support@limit-fatigue.com)

### The following slides contain SWX-specific steps to do a LIMIT run using SWX FE results



# **Steps described in this document**

- Overview of Workflow SWX & LIMIT
- Setting SolidWorks options
- Adding a shortcut symbol to the SolidWorks menue
- Using the Interface to export Iswx and job files for LIMIT
- Importing the .job files into LIMIT-CAE
- Selecting geometry and results in the LIMIT JobManager



# Workflow using SWX Simulation results with LIMIT

- Setup and run SWX-Simulation
- Run the SWX4LIMIT-Interface
- Export Finite Element result data for selected studies
- Start LIMIT-CAE
- Import the model and define assessment
- Run the assessment job
- Visualize the results in LIMIT-Viewer

### Setting SolidWorks Options

Abbrechen Hilfe...



### 🕉 SOLIDWORKS 🛛 Datei Bearbeiten Ansicht Einfügen Extras Simulation Toolbox Fenster Hilfe 🥥 🗋 🛛 🚱 - 🌄 - 🌭 **Default settings in SolidWorks:** 💯 🕫 🏧 🐚 🚱 🖪 🔽 🖂 ∑ 🖄 👍 🌣 🛃 🕰 - 🌉 | 🕅 i 🍳 Studie. Material Lasten/Finspannun Click Simulation/Options in the simulation ruppe Layout Skizze Evaluieren Office Pro Kontakt/Abstanc Schalen 🥸 👩 🕅 Netz module Fatigue-Demo (-1<-1\_Display State</p> Historie Ergebnisse darsteller Annotatio Ergebnisse auflisten Ergebniswerkzeuge Front (1) Top (2) Click Standard options/results Bild in Bericht aufnehm Ermüdung and choose Alle Feature-Flächen auswähle (f) Part1<1> -> (-1<<-1)</p> S Verknüpfungen in Fatigu Bewegungslasten importieren. Historie 'keep temporary data base files' Annotation Sensors Hilfe Volumenkörper(1) Oberflächenkörper(1) Material < nicht festgelegt:</p> Simulation Info Eront (1) Top (2) Menü anpasser Right (3) × To run a LIMIT-Job with SWX-Results Standardoptione Systemoptionen Standard-Solve Finheiten Automatisch these settings are necessary and all the Last/Einspannung Direct Sparse Solve FFEPlus files generated by SolidWorks after the Farbdia Ergebnisordner Standarddai SolidWorks Dokumentordne 🗄 < Ergebnisse o Unter Unterordner Darstellung SWX-FEM-run have to be placed in the Benutzerdefiniert Darstellunα2 Darstellung3 c\users\schloegl\appdata\local\temp QUErgebnisse der Frequenz-/Knickstu Temporäre Datenbankdateien behalter LIMIT work directory. 📲 Ergebnisse der thermischen Studie Um den Ergebnisordner für eine bestehende Studie zu änderr Darstellung1 modifizieren Sie die Option unter den Studieneigenschaften 🐝 Ergebnisse der Fallprüfungsstudie Darstellung1 Trenderfassung It is recommended to use the SWX work Darstellung2 Modelle für Wiederherstellung zu Iteration sichern Darstellung3 🗬 Eraebnisse der Ermüdunasstudie Darstellung1 directory also as LIMIT work directory. Darstellung2 Recebnisse der Optimierungsstudie 🕊 Ergebnisse der Nicht-linearen Studie Darstellung1 Darstellung2 Darstellung3 Anwenderinformationer Bericht



### Adding a shortcut button





### Adding a shortcut button

Click Shortcut Bars' ————————————————————————————————————	Customize
	Toopers Shortcut Bars Commands Menus Keyboard Mouse Gestures Customization
Select ,Macro'	Select a Shortcut Toolbar to Customize
Drag the ,New Macro Button' Symbol to the menu you want the button to be. Make sure to use a toolbar you use in part and assembly environment, otherwise you have to repeat this step while you create a new assembly.	Select a toolbar, then click a button to see its description. Drag the button to any toolbar. Description Command Search Region Activate Command Search when the shortcut bar is launched
	OK Cancel Help





### In the appearing window, Click onto the button with the three dots 🚮 Öffnen X 190-2-1-02-0 🚱 💭 🖉 💺 « Volume (D:) 🕨 SWX Tools 🕨 SWX Export4Limit ▼ ↓ SWX Export4Limit durc... Organisieren • 1 - 0 Customize Neuer Ordner Toolbars Shortcut Bars Commands Menus Keyboard Mouse Name Änderungsdatum Тур 🚖 Favoriten Desktop SWXExport4Limit2015.swp 25.02.2016 11:39 SWP-Datei Downloads Toolbar: Macro Zuletzt besucht Buttons ConeDrive 🕨 🔳 🕪 😭 🛒 👼 Creative Cloud F 23 Customize Macro Butto Select the file location of your Action 🚴 Dokumente Macro: ,SWXExport4Limit201x.swp' and click 🌲 Musik Method: Videos Location of the files: Heimnetzgruppe Appearance 💐 Computer ...\LIMIT-CAE-Release-💩 OS (C:) Volume (D:) 201x\solidworks\SWX 201x Prompt SWX Tools SWX Export4Li DVD-RW-Laufwer Export4Limit2015.swp SW VBA Macros (\*.swp) Activate Command Search when the shortcut bar is laur Öffnen Abbrechen OK Cancel Help

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### Adding a shortcut button







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# Click onto the button you just created An error message will appear Click ,Debug' Microsoft Visual Basic Run-time error '53': File not found Continue End Debug Help





stress evaluation



The ,SWX Export4Limit201x' window appears and the shortcut menu setup is finished.

stress evaluation

SWX Export4Limit 2015	V 1.0	toron to seat a				
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### Using the Interface to export lswx and job files

- Open any assembly or part document containing your studies
- Make sure your SolidWorks
   Simulation package is running (If not, use Tools → Add-ins to run it)
- Run the Interface with the created shortcut button
- Click ,Read current SWX file'

Read current SWX file	Save to			Advanced options		Quit			
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Status									
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### Using the Interface to export lswx and job files





### Using the Interface to export lswx and job files



**General Hints** 



- You can run the Interface without the SolidWorks shortcut button, e.g. via Windows explorer
- The Interface will not work if ,run as administrator' is set
- If you have more versions of SolidWorks installed, please contact LIMIT support



### Importing the .job files into LIMIT-CAE

### **Importing the .lswx -file into LIMIT-CAE:**

- Click File / Import / FE Model: Solidworks
- Use the .lswx file, since it includes all mesh and result data!







### Importing the part information into LIMIT-CAE

Ι.

### **Importing the SWX part information:**

- Click: Sets / Open Set Manager / ....
- I. Click on folder icon
- II. Select:SW-Sets-[....].inp
- **File includes:**
- Part information
- SW\_Sets for quick generation of sensors

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### Importing the .job files into LIMIT-CAE

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### Interface LIMIT - SolidWorks



### Importing the .job files into LIMIT-CAE

Running simulat	g a LIMIT job based on a SolidWorks ion:	C Edit Rename as:	[	Job_1	<b></b>
+	Create a new Job	General Preference:	limit_solidworks_x64_ger_v2016r1.bat	dit	•
+	Select the preference SolidWorks	Output Groups: Report Groups:	A A	\dd	=
+	Result File:	Output Nsets:	A kastentraeger-Statische-Analyse-1.LSWX	Add ?	Select
	Select the result file (.lswx), if none were	Geometry File: Stress Type:	kastentraeger-Statische-Analyse-1.LSWX	?	Select
	defined in the LoadManager	Rainflow Param: AutoFreesurf:	E	dit	• •
+	Geometry File: Always select a .lswx-file to define the	Analysis Type:	Fatigue Limit Selected: PS0026 Setup_1	Existing: PS0026 Setup_1 MoveToSelected	
	reference geometry for the analysis	Loads	Selected:	Use Spectra Existing: Default (GROUP) LC1 (LOAD) LC2 (LOAD) MoveToSelected	Use Loads
		Apply			Cancel



### Solid assessment:

### **Goal of a LIMIT FKM proof of strength:**

- Assessment of surface stresses (2D-tensors)
- Popular method and conservative

### Free surfaces:

- Are necessary for the consideration of stress gradients normal to the surface
- Are identified by the software LIMIT
- Can be generated by covering the solids with 2D-elements (skin) in the preprocessor.

### Supporting effect is only possible with solids!

 Results of a 3D analysis with good element quality and fine meshing are more precise than results of 2D-skin elements.



### Following elements can be analyzed:

- **Solids** :
  - Higher order 3D-Solids (10 nodes tetrahedrons)

### Shells:

Higher order shells (6 nodes triangles)



### **Specification of the interface**

- Maximum nodenumber respectively elementnumber :
  - Windows 64 bit (x64): 5000000
- Maximum number of nodes :
  - Windows 64 bit (x64): 6000000
- Maximum number of elements :
  - Windows 64 bit (x64): 6000000
- These LIMITS can be changed by the user. See document LIMIT\_2019, section: Redimensioning of Arrays



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Last Slide