

## Polytec StrainProcessor

Understanding the origin of the stress and strain distribution is crucial to increasing the durability of components under dynamic load. Numerical simulations based on finite element (FE) models help with this understanding but must be validated by reliable test data.

Polytec's PSV-3D Scanning Vibrometer provide full-field and non-invasive test data with high spatial resolution.

Polytec StrainProcessor represents a post-processing solution to derive strain and stress data for direct model validation.

Polytec StrainProcessor operates directly on PSV-3D data for visualisation and analysis in the PSV software.



### Highlights

- True response – unloaded measurements
- High spatial resolution – true localization of stress hot-spots
- FE geometry import – no interpolation of geometry or coordinate systems
- Quick setup – laser control by software
- Wear-free laser sensor
- Pattern-free measurement – laser Doppler-interferometry
- Down to nano-strain resolution

## Polytec StrainProcessor

Revealing the true strain distribution

Datasheet



# Functional description

Polytec StrainProcessor is a stand-alone post-processing software that calculates dynamic strain as well as dynamic stress distributions based on PSV-3D Scanning Vibrometer data. The software is part of the range of options for the PSV software. Polytec StrainProcessor directly processes the scan files in the Scanning Vibrometer Data (\*.svd) format and stores the results into the processed scan file as user defined data sets (UDDS). The results are visualized in the PSV software.

Two measurement grid definition methods are available: Import of geometry data from FE models in STL or Universal File Format or manual grid definition by onboard tools of the PSV software. The acquisition of operational deflection shapes is performed in 3D at a subset of FE nodes.

SignalProcessor calculates the strain values projected to a global coordinate system from the in-plane components of the SVD data file and the geometry information. In addition for isotropic materials stress values are calculated based on given Young's modulus and Poisson's ratio.

## Scope of delivery

<b>i</b>	<b>Version</b>	<b>Description</b>
	PSV-S-STRAIN	Software license update for existing PSV-500-3D Scanning Laser Vibrometer hardlock, documentation
	PSV-S-STRAIN-Xtra	Software license update for existing PSV-500-3D Scanning Laser Vibrometer hardlock, documentation, infrared detector card and software component for pilot laser calibration of PSV-I-560/PSV-I-570 Xtra Scanning heads
	PSV-S-STRAIN-DS	Desktop (Offline) license, separate hardlock, documentation Includes a premium license for PSV Desktop Software
	PSV-S-STRAIN-D <sup>1</sup>	Desktop (Offline) bundle license, separate hardlock, documentation Includes a premium license for PSV Desktop Software

<sup>1</sup> Only available if the PSV-S-STRAIN Strain Processor is already purchased and installed on the PSV-3D measurement system

<b>Software</b>	<b>Description</b>
PSV StrainProcessor	Post processor for PSV-3D vibration data (*.svd) generated with PSV Software
Input file format	*.SVD (Scanning Vibrometer Data) files <sup>1</sup>
Parameters	Young's Modulus, Poisson's Ratio, spatial filter settings
Output	Strain and stress results stored in User Defined Data Set (UDDS) of the original *.SVD input files. Batch processing possible
Strain processing	Strain in global coordinates (linear and shear) Input of Poisson's ratio
Stress processing	Stress in global coordinates (linear and shear) Global stress Minimum and maximum principal stress Von Mises stress Input of Young's modulus and Poisson's ratio
Filtering	Advanced spatial filtering, display of geometrical difference between filtered and unfiltered data Normal Shape calculation e. g. for temperature drift compensation
Additional features	Calculation for all frequency bands defined in the *.SVD file, automatic removal of outliers, batch processing
Visualization	Visualization of dynamic strain and stress in PSV Software

<sup>1</sup> Files created with the option "Combined File" cannot be processed

### Compatible Vibrometer Models

PSV-500-3D Scanning Laser Vibrometer	All PSV-500-3D models including models with Xtra Scanning head
PSV-400-3D Scanning Laser Vibrometer	All PSV-400-3D models; External HD camera A-CAZ-1000 recommended

### System requirements

For PSV-S-STRAIN-D/DS Desktop version (offline processing)	<ul style="list-style-type: none"> <li>• Minimum system requirement: processor with SSE2 instruction set like AMD® Athlon™ 64 3500, Intel® Pentium™ 4, Intel® Celeron™ D, 1 GByte RAM</li> <li>• Recommended system configuration: Intel® Core™ 2 Duo, 2.4 GHz, 2 GByte RAM</li> <li>• Windows 10 64-Bit, Windows 10 32-Bit, Windows 8 64-Bit, Windows 8 32-Bit, Windows 7 64-Bit (SP1) or Windows 7 32-Bit (SP1)</li> </ul>
For PSV-S-STRAIN/STRAIN-XTRA (online processing on measurement system)	Data management system capable of running PSV software release 9.4.1 or higher
PSV Software Version	Data import: PSV release 9.0 or higher Date visualization: PSV release 9.4 or higher

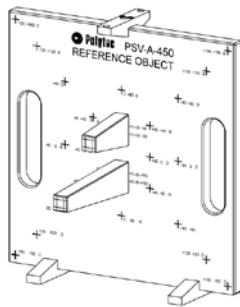
Feature	Description
Field of view	Diameter of <10 mm to >1000 mm
Resolution	Better than 1 μm/m (< 1 με)
Max. velocity	500 mm/s typical
Max. displacement	1/1000 of the field of view, recommended < beam diameter of the laser
Bandwidth	Recommended < 100 kHz, depending on measurement conditions

# Options and accessories

Option	Description	Standard/Option
PSV-S-TRIA VideoTriangulation	Software option optimizing the 3-D geometry for enhanced strain resolution	S/O <sup>1</sup>

Accessories	Description	Standard/Option
PSV-A-450 Reference Object for 3D Alignment	Rigid support of 3 PSV scanning heads. Provides a configuration optimized for in-plane performance with small parts	○
PSV-A-T34 Table Tripod	Provides optimized positioning for small sized objects Horizontal measurement direction	○
A-MIR-2030 Mirror set	Mirror set for vertical measurements with PSV-A-T34	○

<sup>1</sup> Included in PSV-500-3D, mandatory option for PSV-400-3D  
 S = Standard/included  
 ○ = Option



**PSV-A-450 Reference Object  
for 3D Alignment**



**PSV-A-T34 Table Tripod**



**A-MIR-2030 Mirror set**

For more information visit [www.polytec.com/software](http://www.polytec.com/software)

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