



# Tesseral Products

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- ✓ Customer Service: [support@tetrale.com](mailto:support@tetrale.com)
- ✓ Licensing price is provided as a separate **Price List** document. Sales: [sales@tetrale.com](mailto:sales@tetrale.com)

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## New! Implemented GPU modeling procedures

**Comparison with CPU Intel Xeon E5345 2.33**

- NVidia GeForce 560 Ti
  - Speedup: x30-x50 times
- NVidia Tesla M2050 (recommended)
  - Speedup: x40-x60 times

## 1. Main Tesseral Products

*(licensed as work-seats)*

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Support 3 types of licensing:

- ✓ Alpha-digital key;
- ✓ Single-user (local) USB-key;
- ✓ Network Alpha-digital or USB-key.

For testing of all capabilities of the package potential customer have to:

- ✓ install the package
- ✓ execute Tesseral.exe;
- ✓ copy from provided dialog "Registration" outgoing key and send it to the company Customer Service to obtain temporary alpha-digital incoming key.

After purchasing of the package, the client receives from Tesseral Technologies a number of licensing keys, indicated in the License Agreement. For example, one network key for 5 work-seats in office, two local (transferable) keys for employees working separately and one alpha-digital key for a standalone service PC. In the whole: 5+2+1=8 work-seats.

### ***1.1. Workstation Standard - Tesserall 2D***

This main product includes broad spectre of effective algorithms of full-wave modeling based on finite-difference calculation scheme. It allows to model seismic wave field propagation in **acoustic, elastic, elastic anisotropic** (including three systems of fracturing) and **viscoelastic** approximations of wave equation.

This product is mostly oriented towards **typical modeling and modelbuilding**, where particular model is representing some schematic or/and generalized geology conditions.

- Graphic user interface for visualization of source data and results.
- Graphic user interface for modelbuilding:
  - as a set of polygons. Physical properties with constant or complex gradient distribution can be separately assigned to each polygon. Raster image can be used as a background for drawing polygons. Geological-seismic 2D model of practically any complexity can be quickly built;
  - using 2D velocity model grid, and other parameter grids (if presented) in SEG-Y format;
  - using well-log data (Vp, Vs, density) in vertical wells with manual correction of depth;
  - combination of mentioned above methods;
  - import from different formats.
- Interpretation of results of modeling (pre-stack level) - shotgathers (Z and X components of instant particle velocity, hydro-pressure), snapshots (movies) of the propagating seismic wave field, AVO-modeling.
- Seismic imaging procedures for post-stack level of analysis and interpretation - variety of 2D stacking, 2D in time and depth domain pre-stack and post-stack migration procedures including VSP depth migrations.
- Interface for running parallel calculations and 2.5D-3C modeling.
- Includes support of parallel computations using multicore and GPU processing on local workstation;

*For more details, about this and other products please see also relating advertising document.*

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### ***1.2. Workstation Professional - Tesserall Pro***

- Tesserall Pro additionally allows to create model for particular geological area (**object-oriented modeling and modelbuilding**):
  - basing on well data (uses well coordinates and inclinometry, stratigraphy in wells, sonic logs seismic logs and other, horizon maps etc);
  - by 3D velocity model in SEG-Y format.
- Visualization of 3D gathers and seismic cubes as cross-sections and slices, 3D visualization of seismic cubes, cross-sections, maps and wells;
- 2D and 3D ray-tracing allowing to produce gathers for particular wave types (for example, without multiple reflections) and may be used for illumination study and other kinds of wave field analysis;

*Please, see also relating overview. License of Tesserall Pro (Professional) is also valid for Tesserall 2D, which from licensing viewpoint is considered as a Standard edition.*

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### ***1.3. Workstation Freeware - Tesserall View***

- Functionally limited variant of Tesserall 2D. Includes only 2D modeling capabilities.

- Does not save modified models and export results into SEG Y format.
- Does not require licensing.

## 2. Parallel Computation Options

*(can be only used with one of basic products, licensed as a number of processing cores. GPU variant is licensed per number of GPUs)*

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### **2.1. Workstation Parallel Core 2-2.5D computation - Tesseral Local engine**

- Realizes parallel calculations for all 2D modeling algorithms, 2D depth migration and **2.5D-2C modeling (as option, see Error! Reference source not found. )**.
- For GPU variant second graphic card may be required on workstation to assure stability of calculations.

### **2.2. Cluster Parallel Core 2-2.5D computation - Tesseral Linux and Tesseral Farm engine (Windows Network and Clusters)**

- Realizes parallel calculations for all 2D-2C and 2.5D-3C modeling algorithms in two variants: by cores and by GPUs.
- Distribution of processors between multiple calculation tasks is supported.
- Taking into account that 2.5D-3C modeling is relatively computationally extensive (which, depending from offset extent by Y may take about 100-1000 times more time than corresponding 2D-2C modeling) it is recommended to use cluster with 64 or more parallel processors.
- GPU variant uses CUDA (Open CL) graphic cards.

#### ❖ Linux

- Consists from a number of source files with already compiled libraries for gcc and Intel compilers (recommended is Intel compiler).
- For installing/testing the utility on Linux system you have to:
  - ✓ compile the program;
  - ✓ initiate utility on all cluster nodes;
  - ✓ send to Tesseral Technologies Customer Service produced by the program passport file,
  - ✓ receive back license file and put it in the program folder.
- Distribution of processor-cores between multiple calculation tasks is supported.
- This utility requires installation and tuning of one of MPI realizations.

#### ❖ Windows

- Consists from main module (Host), which have to be installed on workplace from which will be initiated parallel computations, and a number of computation modules (Nodes) which can be installed on any number of computers in local network.
- Is provided for installation as executable module.
- This utility requires installation and tuning of one of MPICH2 (it can be downloaded as freeware).