CFD
Computational Fluid Dynamics

Unstructured Mesh
(Tetrahedron, pentahedron and hexahedron)

SC/Tetra

Windows and Linux

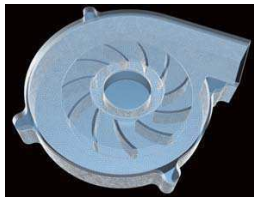
CRADLE

What is SC/Tetra?

SC/Tetra is an all-in-one package CFD (Computational Fluid Dynamics) software using unstructured mesh (tetrahedron, pentahedron and hexahedron). It was developed in 1998 with the concept as "Enabling the calculation of a complex geometry easily".

[Features]

❶Practical use of CAD data

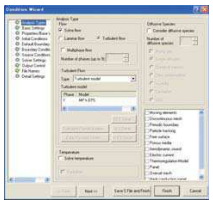


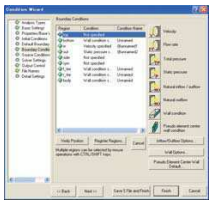
Assuming that the CAD data for the product design will be directly used as the analysis model, SC/Tetra has many useful functions for repairing and wrapping the geometry and checking the CAD data for any errors or detects. Simple geometries such as the computational domain can also be made directly in SC/Tetra.

❷Robust Auto-mesh generation function

The robust auto mesh generator can handle any kind of complex geometry. The prism mesh will be fitted automatically to improve calculation accuracy. In addition, the adaptive mesh refinement function automatically generates adaptive mesh by repeating the simulation and considering the previous analysis result.

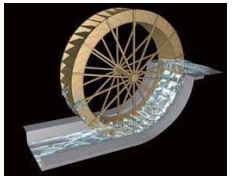
❸Interactive wizard for analysis condition settings



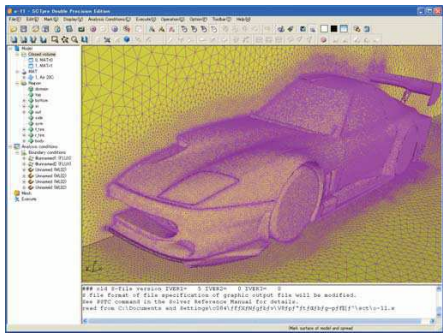


The steps you need to take is shown as tree bar in the wizard. Therefore, the setting can be done smoothly and it prevents data input omission.

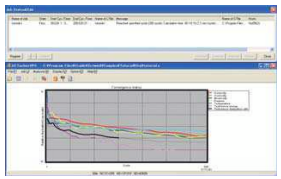
❹Ample of analysis functions



SC/Tetra can solve not only flow or temperature analysis, but also the analysis for diffusive species, free surface, chemical reaction, particle tracking, and rotation / translation of an object considering the fluid effects. Furthermore, it is able to evaluate the aero acoustic problem and physiological factors of human body.



❺Low memory usage and high computational speed



SC/Tetra achieves low memory usage and high speed computations by using the cell vertex based scheme, FVM (Finite Volume Method). With this, even a Windows PC with 64 GB of RAM memory can handle more than 300 million elements. The calculation is controlled by a JOB status & edit window which allow you to check the calculation status and to execute the batch processing, interruption and restarting the calculation.

❻Cutting edge visualization

Postprocessor enables you to visualize the simulated data as well as extracting predicted physical values. Since sharing simulation results with colleagues and customers is an important design process, it enables to create high quality images and animations. In addition, utility tools are equipped to handle extremely large files, to quickly visualize and to share your 3D data using a license-free viewer.

[Applications]

●Automotive industry
Vehicle body aerodynamics
Cabin climate control
Thermofluid analysis of engine rooms
Internal flow analysis in engine cylinders
Intake and exhaust efficiency assessment
Disc brake cooling analysis
Torque converter performance evaluation
Hydrodynamic analysis in water jackets

●Machinery industry
Performance evaluation of rotating equipments
(fan, pump, turbine)
Internal flow through turbine rotor blades
Temperature and concentration analysis in a mixing tank
Heat radiation analysis in a reverberatory furnace
Performance investigation of CVD device

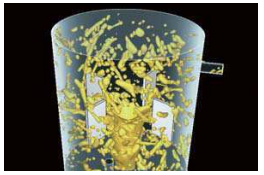
●Electrical and precision equipment
Heat dissipation analysis of the liquid crystal projector
Cooling design of electronic devices
Thermal analysis of power units and circulation in
an electronic chassis
Natural and forced convection in an electrical components

●Construction and civil engineering
Estimation of wind turbulence around skyscrapers
and assessment of urban planning
Wind loading effects on buildings

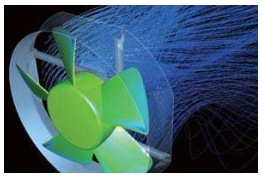
●Environment and facilities
Indoor air conditioning and environmental assessment
Temperature distribution in a hot water storage tank
Lift and drag force estimation of a propeller blade

●Cabin climate control

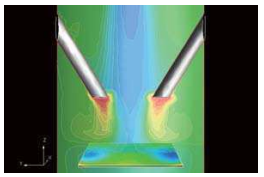
●Mixing tank



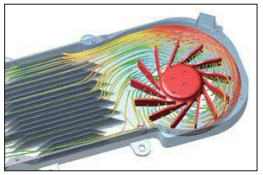
●Fan



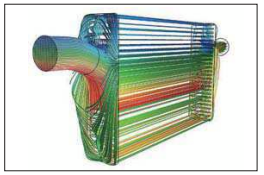
●CVD



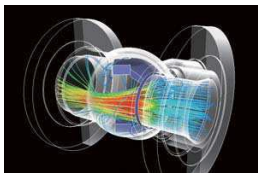
●Dissipation Fin with Fan



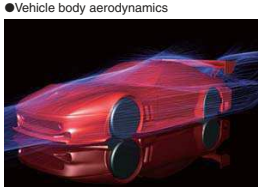
●Heat exchanger



●Valve



●Vehicle body aerodynamics



Utility Tools

●LFileView
Real-time graphical output of the values listed from Solver. Arithmetic operations are implemented for listed parameters.Arithmetic operation is flexibly executed using any parameters listed from Solver.
●FLDutil
Data mapping to structual analysis system such as ABAQUS, ANSYS I-DEAS, NASTRAN.
●CradleViewer : Free results viewer

Items included in the Package

●SC/Tetra installation DVD
●User's guide
• Basics of CFD Analysis
• Reference Preprocessor / Solver / Postprocessor
• Operation Manual • Exercise

System Requirements

●Windows
• XP Professional, XP Professional x64 Edition
Vista Business, Vista Ultimate
(Open GL compliant graphics board is recommended)
• Intel compatible CPU
●Linux
• RedHat Linux Enterprise 4 and 5
• SuSE Linux Enterprise Server 9 and10
●512 MB or more memory
●1GB or more available disc capacity

Products

Platforms \ Package	PRE/SOL/POST	SOL	PRE/POST
Windows (Standard)	○	○	○
Windows (HPC)	—	○	○
Linux (Standard / HPC)	—	○	—

●Contract Type: Rental / Lump Sum.
●License Type: Node Locked / Floating

Options

●CAD-CFD geometry data translator
• CADthru
●Fluid bearing design package
• Fluid Bearing Designer