
ANSYS
19
19.0 CAPABILITIES

ANSYS

● = Fully Supported
▲ = Limited Capability
□ = Requires more than 1 product

	ANSYS Mechanical Enterprise	ANSYS Mechanical Premium	ANSYS Mechanical Pro	ANSYS DesignSpace	ANSYS Autodyn	ANSYS LS-DYNA	ANSYS AIM
STRUCTURES							
Geometric Idealization							
Spring	●	●	▲	▲	●	●	●
Mass	●	●	●	●	●	●	●
Damper	●	●			●	●	
Spar	●	●	●	●			
Beam	●	●	●	●	●	●	
Pipe/Elbow	●	●	●	●			
Shell - Thin	●	●	●	●	●	●	●
Layered Shell - Thin (Composite)	●	●			●	●	
Shell - Thick (Solid Shell)	●	●	●	●			
Layered Shell - Thick (Solid Shell) (Composite)	●	●					
2D Plane / Axisymmetric	●	●	●	●	●	●	
3D Solids	●	●	●	●	●	●	●
Layered 3D Solids (Composite)	●	●					
Infinite Domain	●	●	●		●	●	
2.5D	●	●					
Reinforced	●	●			●	●	
ROM	●						
Substructuring / Matrix	●						
Modeling Capabilities							
Contact - Linear	●	●	●	●	●	●	●
Contact - Nonlinear	●	●	●	▲	●	●	●
Joints	●	●	●		●	●	●
Spot Welds	●	●	●		●	●	
Birth and Death	●						
Gaskets	●						
Rezoning and Adaptive Remeshing	●				●	●	
Materials							
Basic Linear Materials (Linear, Anisotropic, Temperature Dependent).	●	●	●	●	●	●	●
Basic Nonlinear Materials (Hyper, Plasticity, Rate Independent, Isotropic, Concrete).	●	●			●	●	▲
Advanced Nonlinear Materials (Rate dependent, Anisotropic, Damage Models, Geomechanics Materials, Multiphysics).	●				●	●	
Field Dependent	●	●					
Reactive Materials	●				●		
Fracture Mechanics	●						

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	ANSYS Mechanical Enterprise	ANSYS Mechanical Premium	ANSYS Mechanical Pro	ANSYS DesignSpace	ANSYS Autodyn	ANSYS LS-DYNA	ANSYS AIM
Composite Materials							
Material Definitions	●	●			●	●	
Layers Definitions	●	▲			●	●	
Solid Extrusion	●						
First-ply Failure	●	●					
Last-Ply failure	●						
Delamination	●				●	●	
Draping	●						
Structural Solver Capabilities							
Linear Static	●	●	●	●			●
Nonlinear Static	●	●	●	▲			●
Pre-Stress effects, Linear perturbation	●	●	●	●	▲	▲	
Nonlinear Geometry	●	●	●		●	●	●
Buckling - Linear Eigenvalue	●	●	●	●			
Buckling - Nonlinear Post Buckling Behavior	●	●	●			●	●
Buckling - Nonlinear Post Buckling Behavior- Arc Length	●	●					
Steady State Analysis applied to a Transient Condition	●						
Advanced Wave Loading	●						
Topology Optimization							
Static Structural	●	●	●	●			●
Modal Analysis	●	●	●	●			●
Design Validation Transfer	●	●	●	●			●
Manufacturing Constraints	●	●	●	●			▲
Multi Analysis							
Submodeling	●	●	●	●			
Data Mapping	●	●	●				●
Trace Mapping	●	●					
Initial State	●	●			●	●	
Advanced Multi-Stage 2-D to 3-D Analysis	●	●					
Vibrations							
Modal	●	●	●	●			●
Modal - Pre-Stressed	●	●	●	●			
Modal - Damped/Unsymmetric	●	●					
Transient - Mode-Superposition	●	●					

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Harmonic - Mode-Superposition	●	●					
Harmonic - Full	●	●					
Spectrum	●	●					
Random Vibration	●	●					
Mistuning	●	●					
Rotordynamics	●	●					
Modal Acoustic	●						
Harmonic Acoustic	●						
Nonlinear Transient Dynamics							
Rigid Body Mechanisms	●	●					
Rigid Body Dynamics with CMS components for flexible bodies	●						
Full Transient	●				●	●	
CMS with Substructuring	●						
Explicit Dynamics							
FE (Lagrange) Solver	●				●	●	
Euler Solvers	▲				●		
Meshless Solvers					●		
Implicit-Explicit Deformations	●				●	●	
Implicit-Explicit Material States	●				●		
Fluid-Structure Interaction (FSI)	●				●		
Mass Scaling	●				●	●	
Natural Fragmentation	●				●		
Erosion Based on Multiple Criteria	●				●	●	
De-Zoning					●	●	
Part Activation and Deactivation (Multi Stage Analysis)					●		
Remapping in Space					●		
Remapping Solution Methods					●		
Durability							
Stress-Life (SN)	●	●	●				●
Strain-Life (EN)	●	●	●				●
Dang Van	□[1]	□[1]	□[1]				
Safety Factor	●	●	●				●
Adhesive Bond	□[1]	□[1]	□[1]				
Crack Growth Linear Fracture Mechanics	□[1]	□[1]	□[1]				
Seam Weld	□[1]	□[1]	□[1]				
Spot Weld	□[1]	□[1]	□[1]				
Thermo-mechanical Fatigue	□[1]	□[1]	□[1]				

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Vibration Fatigue	□[1]	□[1]	□[1]				
Virtual Strain Gauge Correlation	□[1]	□[1]	□[1]				
Python Scripting Customization	□[1]	□[1]	□[1]				
Wave Hydrodynamics							
Diffraction and Radiation	●						
Frequency & Time Domain Motions Analysis	●						
Moorings, Joints & Tethers	●						
Load Transfer to Structural Analysis	●						
Thermal							
Steady State Thermal	●	●	●	●			●
Transient Thermal	●	●	●				●
Conduction	●	●	●	●	●	●	●
Convection	●	●	●	●			●
Radiation to Space	●	●	●				●
Radiation - Surface to Surface	●	●	●				
Phase Change	●	●	●		●	●	
Thermal Analysis of Layered Shells and Solids	●	●					
Additional Physics							
1-D Thermal-flow	●	●	●				
1-D Coupled-field Circuits	●						
1-D Electromechanical transducer	●						
MEMS ROM	●						
Piezoelectric	●						
Piezoresistive	●						
Electroelastic	●						
Electromagnetic	●						▲
Vibro-acoustics	●						
Migration	●						
Diffusion -Pore-fluid	●						
Diffusion-Thermal Structural-Electric	●						
Structural-Thermal-Electric-Magnetic	●						▲
1-Way Fluid-Structure Interaction	□[2]	□[2]	□[2]				●
2-Way Fluid-Structure Interaction	□[2]						

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Optimization							
DesignXplorer Included	●	●	●	●	□[3]	□[3]	●
Parameters	●	●	●	●	●	●	●
Design Point Studies	●	●	●	●	●	●	●
Correlation Analysis	●	●	●	●	●		●
Design of Experiments	●	●	●	●	●		●
Sensitivity Analysis	●	●	●	●	●		●
Goal Driven Optimization	●	●	●	●	●		●
Six Sigma Analysis	●	●	●	●	●		●
Miscellaneous and Usability							
ANSYS SpaceClaim	●	□[4]	□[4]	□[4]	□[4]		●
ANSYS Customization Suite (ACS)	●	□[5]	□[5]	□[5]	□[5]		●
Support ACT Extensions	●	●	●	●	●	●	●
Command snippet support	●	●	●				●
Batch run capability	●	●	●	●	●	●	●
External Code Interfaces	●	●		●	●		
HPC - Structures							
Default Number of Cores	4 (DMP + SMP) MAPDL 4 for Explicit 4 for RBD 4 for AQWA	4 (DMP + SMP)	4 (DMP + SMP)	2 (SMP)	1	1	4 (DMP + SMP) MAPDL
Parallel Solving on Local PC	●	●	●	●	●	●	●
Parallel Solving on Cluster	●	●	●		●	●	
GPU Support	□[6] MAPDL - Yes Explicit - No RBD - No Aqwa - No	□[6]	□[6]	□[6]			

1 = ANSYS nCode DesignLife Products
2 = ANSYS Fluent
3 = ANSYS DesignXplorer
4 = ANSYS SpaceClaim
5 = ANSYS Customization Suite (ACS)
6 = ANSYS HPC, ANSYS HPC Pack or ANSYS HPC Workgroup

DMP = Distributed-memory
SMP = Shared-memory
MAPDL = Mechanical APDL
Explicit = Autodyn
RBD = Rigid Body Dynamics
Aqwa = Aqwa

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	ANSYS CFD Premium		ANSYS CFD Enterprise				
	ANSYS FLUENT	ANSYS CFX	ANSYS POLYFLOW	ANSYS Forte	ANSYS FENSAP-ICE	ANSYS AIM	ANSYS Chemkin Enterprise
FLUIDS							
General Solver Capabilities							
Comprehensive Inlet and Outlet Conditions	●	●	●	●	●	●	●
Steady-State Flow	●	●	●	●	●	●	●
Transient Flow	●	●	●	●	●	●	●
2-D and 3-D Flow	●	▲	●	▲	●	▲	▲
Reduced Order Models (ROM)	●						
Time Dependent Boundary Conditions	●	●	●	●	●	▲	●
Customizable Materials Library	●	●	●	●	●	●	●
Fan Model	●	●			●		●
Periodic domains	●	●	●	●	●	●	●
Flow-driven solid motion (6DOF)	●	●			●		
Pressure-based coupled solver	●	●	●	●	●	●	●
Density-based coupled solver	●						●
Dynamic/moving-deforming mesh	●	●	●	●	●		●
Overset Mesh	●						
Immersed-solid/MST method for moving parts		●	●		●		
Automatic on-the-fly mesh generation with dynamic refinement	●			●			●
Dynamic Solution-Adaptive Mesh refinement	●	●		●	▲		●
Polyhedral unstructured solution-adaptive mesh refinement	●						
Single Phase, non reacting flows							
Incompressible Flow	●	●	●			●	●
Compressible Flow	●	●		●	●	●	●
Porous Media	●	●	●			●	●
Non-Newtonian Viscosity	●	●	●			●	
Turbulence - Isotropic	●	●	●	●	●	●	●
Turbulence - Anisotropic (RSM)	●	●					
Turbulence - Unsteady (LES/SAS/DES)	●	●					
Turbulence - Laminar/Turbulent Transition	●	●			●	●	
Flow Pathlines (Massless)	●	●	●			●	
Fan Model	●	●			●		
Acoustics (Source Export)	●	●			●		
Acoustics (Noise Prediction)	●	▲					
Heat Transfer							
Natural Convection	●	●			●	●	●
Conduction & Conjugate Heat Transfer	●	●			●	●	●
Shell Conduction (including multi-layer model	●						

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Internal Radiation - Participating Media	●	●	●		●		●
Internal Radiation - Transparent Media	●	●					●
External Radiation	●	●				●	●
Solar Radiation & Load	●	●					
Simplified Heat Exchanger Model	●						
Non-equilibrium Thermal Model	●						
Prorous Media	●						
Particles Flows (Multiphase)							
Coupled Discrete Phase Modeling including Thin Wall Films	●	●		●	●	▲	●
Macroscopic Particle Model	●					▲	
Inert Particle Tracking (With Mass)	●	●				▲	
Liquid Droplet (Incl. Evaporation)	●	●		●	●		●
Combusting Particles	●	●		●			●
Multicomponent Droplets	●	●		●	●		●
Discrete Element Model (DEM)	●						
Break-Up And Coalescence	●	●		●	●		●
Erosion	●	●					
Free Surface Flows (Multiphase)							
Implicit VOF	●	●	●				
Explicit VOF	●		●				
Coupled Level Set/VOF	●	●			●		
Open Channel Flow And Wave	●	●					
Surface Tension	●	●		●	●		●
Phase Change	●	●		●	●		●
Cavitation	●	●		●	●		●
Cavitation where multiple fluids and non-condensing gases are present	●						
Dispersed Multiphase Flows (Multiphase)							
Mixture Fraction	●	●					
Eulerian Model including Thin Wall Films	●	●		●	●		●
Boiling Model	●	●		●			●
Surface Tension	●	●		●			●
Phase Change	●	●		●	●		●
Drag And Lift	●	●		●	●		●
Wall Lubrication	●	●		●			●
Heat And Mass Transfer	●	●		●	●		●
Population Balance	●	●		●			●
Reactions Between Phases	●	●		●			●
Granular Model for Dense Bed of Solids	●	●					
Dense Particulate Coupling (DDPM)	●	●					

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Reacting Flows							
Species Transport	●	●	●	●			●
Non-Premixed Combustion	●	●		●			●
Premixed Combustion	●	●		●			●
Partially Premixed Combustion	●	●		●			●
Composition PDF Transport	●	●					
Finite Rate Chemistry	●	●	●	●			●
Pollutants And Soot Modeling	●	●		●			●
Sparse chemistry solver with dynamic cell clustering and dynamic adaptive chemistry	●			●			●
Ability to use Model Fuel Library mechanisms	●			●			●
Flame-speed from Fuel-component Library	●			●			●
DPIK Spark-ignition Model				●			●
Flame-propagation using level-set method (G-equation)				●			●
Internal Combustion Engine Specific Solution	●	●		●			●
0-D/1-D/2-D reactor models and reactor networks							●
Plasma reactions							●
Comprehensive surface-kinetics	●						●
Chemical and phase equilibrium	●						●
Flamelet table generation	●						●
Flamespeed and ignition table generation							●
Reaction sensitivity, uncertainty and path analysis							●
Surrogate blend optimizer							●
Mechanism Reduction							●
Turbomachinery							
MRF/Frozen-Rotor	●	●					
Sliding-Mesh/Stage	●	●					
Transient Blade Row		●					
Pitch Change		●					
Time Transformation		●					
Fourier Transformation		●					
Harmonic Analysis		●					

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	ANSYS CFD Premium						
	ANSYS FLUENT	ANSYS CFX	ANSYS POLYFLOW	ANSYS Forte	ANSYS FENSAP-ICE	ANSYS AIM	ANSYS Chemkin Enterprise
Blade Flutter Analysis		●					
Forced Response Analysis		●					
Flank milled blades		●					
In-Flight Icing							
Simulates Droplet Sizes					●		
Simulates Ice Growth and Performs Visibility Studies					●		
Models Heat Transfer Anti- and De-icing Heat Loads					●		
Rotating frame of reference for the analysis of turbomachines, rotors and propellers					●		
Model ice accretion at engine face (Fan and IGV) and within any number of successive compressor stages					▲		
Aerodynamic degradation (CFD) meets the requirements of Appendix C, Appendix D (Ice Crystals) and Appendix O (SLD)					●		
Optimization							
Parameters	●	●	●			●	
Design Point Studies	●	●	●			●	
Correlation Analysis	●	●	●			●	
Design of Experiments	●	●	●			●	
Sensitivity Analysis	●	●	●			●	
Goal Driven Optimization	●	●	●			●	
Six Sigma Analysis	●	●	●			●	
Adjoint Solver for Shape Optimization	●						
Adjoint solver supports rotating reference frames & conjugate heat transfer	●						
Multi-objective-constrained optimization	●						
Mesh Morphing (RBF Morph)	□						
High Rheology Material							
Viscoelasticity			●				
Specialty Extrusion Models			●			▲	
Specialty Blow Molding Models			●				
Specialty Fiber Spinning Models	●						

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HPC – Fluids							
Parallel Solving On Local PC Option	●	●	●	●	●	●	●
Parallel Solving Over Network Option	●	●	●	●	●	●	●
GPU Support	●		●				
Pre and Post Processing							
Photo realistic rendering	●	●	●	●	●		●
SpaceClaim Direct Modeler	●	●	●	●	●	●	●
Compare multiple runs, datasets physics, graphs in a single window	●	●	●	●	●		●
MULTIPHYSICS							
Advanced, Automated Data Exchange	●	●	●		●	●	
Accurate Data Interpolation Between Dissimilar Meshes	●	●			●	●	
Drag-n-Drop Multiphysics	●	●	●				
Direct Coupling Between Physics	●	●				●	
Collaborative Workflows	●	●				●	
Fully Managed Co-Simulation	●	●					
Flexible Solver Coupling Options	●	●			●		
Fluid-Structure Interaction							
Force Induced Motion/Deformation	□	□	●			●	
Fluid Thermal Deformation	□	□				●	
Electro-Thermal Interaction							
Convection Cooled Electronics	●	●					
Conduction Cooled Electronics	●	●					
High Frequency Thermal Management	●	●					
Electromechanical Thermal Management	●	●					
Other Coupled Interactions							
Aero-Vibro Acoustics	●						
Acoustics-Structural	●	●					
Fluid Magnetohydrodynamics	●	●					
Miscalleneous and Usability							
Support ACT Extensions	●						
Ansys Spaceclaim						●	

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	ANSYS Maxwell	ANSYS HFSS	ANSYS SIwave	ANSYS Q3D Extractor	ANSYS Icepak	ANSYS AIM
ELECTRONICS						
Low Frequency Electromagnetics						
Electrostatics	●					
AC Conduction	●					●
DC Conduction	●					●
Magnetostatics	●					●
Adaptive Field Mesh	●	●	●	●		●
AC Harmonic Magnetic	●					●
Electric Transient	●					
HPC Frequency Sweeps	●					
HPC Enabled Matrix Multiprocessing	●					
HPC Time Distribution Solver	●					
Magnetic Transient						
Translational Motion	●					
Fully Automatic Symmetrical Mesh Generation	●					
Rotational Motion	●					
Non-Cylindrical Motion	●					
Advanced Embedded Circuit Coupling	●					
Circuit Coupling with Adaptive Time Stepping	●					
Direct and Iterative Matrix Solvers	●					
Advanced Magnetic Modeling						
Vector Hysteresis Modeling	●					
Hysteresis Modeling for Anisotropic Material	●					
Frequency Dependent Reduced Order Models	●					
Equivalent Model Extraction (Linear-Motion, Rotational-Motion, No-Motion)	●					
Functional Magnetization Direction	●					
Magnetization/De-magnetization Modeling	●					
Manufacturing Dependent Core Loss Models	●					
Noise - Vibration Modeling	□					
Temperature De-magnetization Modeling	●					
Core Loss computation	●					●
Lamination Modeling	●					

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Magnetostriction and Magnetoelastic Modeling	●				
Hardware in the Loop modeling	●				
Integrated Motor Synthesis and Design Kit	●				
Integrated Planar Magnetics Synthesis and Design Kit	●				
Integrated System and circuit simulation	●				
High Frequency Electromagnetics					
Multi-frequency broadband adaptive meshing		●			
Frequency, Integral Equation and Time Domain Analysis		●			
Eigenmode Analysis		●			
Hybrid Finite Element/Integral Equation Analysis		●			
Hybrid Finite Element/Shooting and Bouncing Ray Analysis		●			
Modal Wave Port Excitation		●			
Lumped, Voltage and Current Excitations		●			
Floquet Excitations		●			
Incident Wave Excitation		●			
Magnetic Ferrite Bias Excitation		●			
Terminal Solutions		●			
Perfect Electric and Magnetic Boundary		●			
Finite Conductivity Boundaries		●			
Lumped RLC Boundary		●			
Symmetry Boundary		●			
Periodic Boundary		●			
Frequency dependant materials		●			
Higher and Mixed order Elements		●			
Curvilinear Elements		●			
Fully automated adaptive mesh refinement		●			
S,Y,Z Matrix Results		●			
E, H, J, P Field Results		●			
Direct and Iterative Matrix Solvers		●			
HPC Accelerated Frequency Sweeps		●			
HPC Enabled Matrix Multiprocessing		●			
HPC Distributed Hybrid Solving		●			

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Antenna Parameter Calculation		●			
Infinite and Finite Antenna Array Calculations		●			
Radar Cross Section calculation		●			
FSS, EBG and Metamaterial Calculation		●			
Specific Absorption Rate Calculation		●			
EMI/EMC Calculation		●			
System Level EMI and RFI analysis		●			
Linear Circuit Analysis with EM Dynamic link		●			
Integrated Antenna Synthesis and Design Kit		●			
Integrated Links to Delcross Savant Shooting and Bouncing Ray+ (SBR+) Solver		●			
Integrated Link to Delcross EMIT RFI/EMI System Solver		●			
Integrated Parametric 3D Component Libraries		●			
RF Link Budget Analysis	●	●			
Wireless Propagation Models	●	●			
Visual Ray Tracing	●	●			
Power and Signal Integrity					
Board Simulation Capabilities					
Electronics Desktop 3D Layout GUI		●	●		
ECAD Translation (Altium, Cadence, Mentor, Pulsonix, & Zuken)		●	●		
MCAD (.sat) Generation from ECAD		●	●		
Lead Frame Editor		●	●		
DC Voltage, Current and Power Analysis for PKG/PCB			●		
DC Joule Heating with ANSYS Icepak			●	●	●
Passive Excitation Plane Resonance Analysis			●		
Driven Excitation Plane Resonance Analysis			●		
Automated Decoupling Analysis			●		
Capacitor Loop Inductance Analysis			●		
AC SYZ Analysis - PI, SI, & EMI		●	●		
Dynamically Linked Electromagnetic Field Solvers		●	●		

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	ANSYS Maxwell	ANSYS HFSS	ANSYS SIwave	ANSYS Q3D Extractor	ANSYS Icepak
Chip, Package, PCB Analysis (CPM)		●	●		
HPC SYZ Speed Up		●	●		
Near-Field EMI Analysis			●		
Far-Field EMI Analysis			●		
Characteristic Impedance (Zo) PKG/PCB Scan			●		
Full PCB/PKG Cross-talk Scanning			●		
TDR Analysis		●	●		
Transient IBIS Circuit Analysis			●		
SerDes IBIS-AMI Circuit Analysis			●		
Macro-Modeling (Network Data Explorer)		●	●	●	
Steady State AC (LNA) Analysis		●	●		
Virtual Compliance - DDRx, GDDRx, & LPDDRx			●		
Synopsys HSPICE Integration			●		
Cadence PSPICE Support			●		
Electromagnetically Circuit Driven Field Solvers		●	●		
RLCG Parasitic Extraction					
DCRL, ACRL & CG Solver			●	●	
IC Packaging RLCG IBIS Extraction for Signals & Power			●	●	
Touchpanel RLCG Unit Cell Extraction			●	●	
Adaptive Meshing for Accurate Extraction			●	●	
Bus Bar RLCG Extraction				●	
Power Inverter & Converter Component Extraction				●	
Specialized Thin Plane Solver for Touchpanel Extraction				●	
HPC Acceleration for DCRL, ACRL, and CG				●	
3D Component Library		●		●	
Reduced RLCG Matrix Operations				●	
SPICE equivalent Modeling Export				●	
DCRL & ACRL Joule Heating Analysis with Icepak				●	
Macro-modeling (Network Data Explorer)				●	
2D Transmission Line Modeling Toolkit				●	
2D Cable Modeling Toolkit				●	

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Electronics Cooling					
Multi-mode Heat Transfer					●
Steady-state and Transient					●
CFD Analysis					●
Turbulent Heat Transfer					●
Multiple-fluid Analysis					●
Species Transport					●
Solar Loading					●
Reduced Order Flow and Thermal					●
Network Modeling					●
Joule Heating Analysis	●	●	●	●	●
Thermo-electric Cooler Modeling					●
Thermostat Modeling					●
Package Characterization					●
Data Center Modeling					●
MULTIPHYSICS					
Platform Technologies					
Advanced, Automated Data Exchange	●	●			
Accurate Data Interpolation Between	●	●			
Dissimilar Meshes	●	●			
Drag-n-Drop Multiphysics	●	●			
Direct Coupling Between Physics	●	●			
Collaborative Workflows	●	●			
Fully Managed Co-Simulation	●	●			
Flexible Solver Coupling Options	●	●			
Electro-Thermal Interaction					
Convection Cooled Electronics		●			●
Conduction Cooled Electronics		●			●
High Frequency Thermal Management		●			
Electromechanical Thermal Management	●				
Miscalleneous and Usability					
Support ACT Extensions	▲	▲	▲	▲	▲

● = Fully Supported
▲ = Limited Capability
□ = Requires more than 1 product

	ANSYS Simplorer	ANSYS SCADE Architect	ANSYS SCADE Suite	ANSYS SCADE Display	Medini Analyze
SYSTEMS & EMBEDDED SOFTWARE					
Virtual Systems Prototyping					
Integrated Graphical Modeling Environment	●		▲		
Standard Modeling Languages and Exchange Formats	●		▲		
Extensive Model Libraries	●		▲		
Reduced Order Modeling (ROM)	●		▲		
Power Electronic Device And Module Characterization	●		▲		
Model Import Interfaces	●		▲		
Rapid Prototyping	●		▲		
Modelica Library Integration	●		▲		
Functional Safety Analysis					
Safety Concept Modelling					●
Model Based Safety Analysis					●
Reliability Prediction and Analysis					●
Traceability and Validation Teamwork					●
Integration into Engineering Environment					●
Customization and Process Adaption					●
ANSYS Product Integration					●
Reporting and Documentation					●
Model-based Systems Engineering					
Model-Based System Design		●			
Functional Safety Analysis		●			
Functional Decomposition		●			
Architecture Decomposition		●			
Allocation Of Functions To Components		●			
Model Checks		●			
System Model Diff/Merge		●			
System / Software Bi-Directional Sync		●			
Model Sharing And IP Protection		●			
Model-Based Interface Control Document Production		●			
Configurable For Industry Standards (IMA, AUTOSAR, Etc.)		●			
Product configuration for automotive developers		●			

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	ANSYS Simplorer	ANSYS SCADE Architect	ANSYS SCADE Suite	ANSYS SCADE Display	Medini Analyze
Embedded Control Software Development					
Data Flow And State Machine Design And Simulation Capabilities			●		
Extensive Set Of Libraries Delivered As Design Examples			●		
Simulation Capabilities			●		
Record And Playback Scenarios			●		
Integration In To Configuration Management Environment			●		
Plant Model Co-Simulation Including FMI			●		
Coverage Analysis For Requirements-Based Tests			●		
Formal Verification			●		
Timing And Stack Optimization			●		
Worst Case Execution Time Estimates On Target			●		
Verification Of Stack Space Requirements			●		
Certified Code Generation For DO-178C, EN 50128, ISO 26262, IEC 61508			●		
Certification Kits For DO-178C, EN50128, ISO 26262, IEC 61508			●		
Man-Machine Interface Software					
Model-Based Prototyping And Specification Of MMIs				●	
Support Of OpenGl, OpenGl SC and OpenGL ES				●	
Integration In To Configuration Management Environment				●	
Font Management				●	
Optimization Of Graphical Specifications				●	
Plant Model Co-Simulation Including FMI				●	
Automatic Generation Of iOS and Android Projects				●	
Certified Code Generation For DO-178C, EN 50128, ISO 26262, IEC 61508				●	
Certification Kits For DO-178C, EN50128, ISO 26262, IEC 61508				●	
Testing capabilities				●	

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	ANSYS Design Modeler	ANSYS SpaceClaim Direct Modeler
GEOMETRY		
Direct Modeling Technology		●
Feature Based Modeling Technology	●	
Open data from all major CAD systems	●	●
Export data to neutral file formats	●	●
Modify imported geometry	●	●
Defeaturing and simplification tools	●	●
Model Repair	●	●
Add Parameters for design exploration	●	●
Extract mid-surfaces/shells and beams	●	●
Extract volumes & create inner fluid domains	●	●
Extract outer air enclosures	●	●
Shared Topology for conformal meshing	●	●
Booleans and slicing	●	●
Create weld bodies	●	●
Boundary condition mapping	●	●
Scripting	●	●
Sketching and editing tools	●	●
3D comparison tools		●
Repair and edit faceted data		●
Icepak integration	●	●
Reverse engineering faceted data		●

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	ANSYS Discovery Essentials	ANSYS Discovery Standard	ANSYS Discovery Ultimate
DESIGN TOOLS			
Structural			
Static Structural Analysis		●	●
Modal Analysis		●	●
Shells, Springs, Point Masses			●
Spatially Varying Loads			●
Nonlinear Contact & Joints			●
Pre-tension Bolts & Multi-step Analsysis			●
Basic Plasticity			●
Large Deformation			●
Fatigue Analysis			●
Topology Optimization			●
Fluid			
Steady-State Flow		●	●
Transient Flow		●	●
Time-dependent Fluid Conditions			●
Incompressible Flow			●
Compressible Flow[1]		▲	●
Non-Newtonian Fluids			●
Periodic Domains			●
Porous Media			●
Particle Flow			●
Thermal			
Steady State Thermal		●	●
Transient Thermal		●	●
Time Dependent Thermal Conditions			●
Conduction		●	●
Convection		●	●
Radiation to Space			●
Electromagnetics			
DC Conduction			●
AC Conduction			●
Magnetostatics			●
AC Harmonic Magnetics			●

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Multiphysics			
Thermal-stress		●	●
Fluid-structure interaction		●	●
Fluid-solid thermal (conjugate heat transfer)			●
Thermal-electric			●
Thermal-electric-stress			●
Thermal-electromagnetic			●
Thermal-electromagnetic-stress			●
Design & Concept Modeling			
Concept Modeling or Detail Design	●	●	●
Part/Assembly Creation or Import	●	●	●
Large Assembly Importing	●	●	●
2-D Drawings, BOM, Exploded Views	●	●	●
Geometric Parameterization	●	●	●
Sheet metal design	●	●	●
Manufacturing			
Repair & Defeature Tools	●	●	●
Sheet metal editing and unfolding	●	●	●
3-D Printing			
Import, repair, edit faceted data[3]	●	●	●
Shelling and infills	●	●	●
Thickness detection	●	●	●
Reverse Engineering			
Autosurface of scanned data	●	●	●
Build solid/surfaces on scanned data	●	●	●
Interfaces and Addons			
Catia/JT translator	●	●	●
Algoryx Momentum[2]	●	●	●
Keyshot rendering[2]	●	●	●

Notes: (1) Discovery Live supports mildly compressible fluid flow up to ~Mach 0.3
(2) Add-on Module
(3) Included with Discovery Standard and Ultimate

ANSYS, Inc.
ANSYS, Inc.
Southpointe
2600 ANSYS Drive
Canonsburg, PA 15317
U.S.A.
724.746.3304
ansysinfo@ansys.com

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