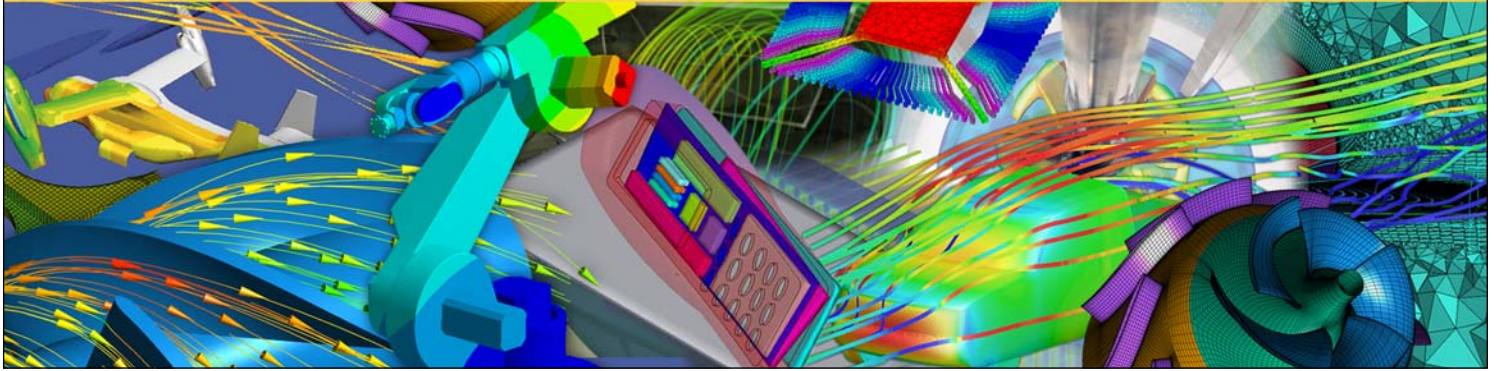




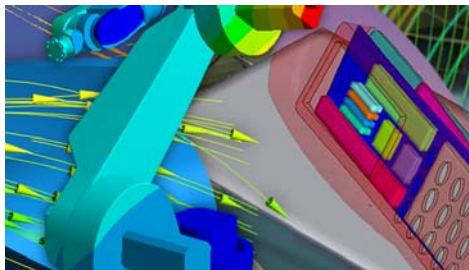
Capabilities Chart

A comprehensive checklist of ANSYS® Workbench™ capabilities

11.0 RELEASE

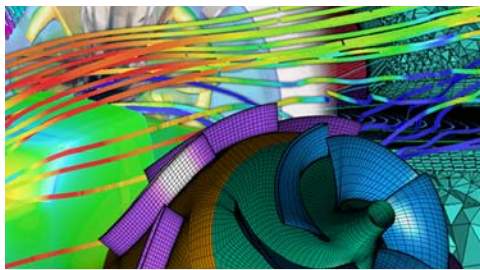


Capability	Complete Simulation Solutions								
	ANSYS® Multiphysics™	ANSYS® Mechanical™	ANSYS® Structural™	ANSYS® Professional NLT™	ANSYS® Professional NLS™	ANSYS® DesignSpace®	ANSYS® Emag™	ANSYS® Rigid Dynamics	ANSYS® PrepPost™
Analysis Type (solver gateway)									
Static structural	•	•	•	•	•	•			•
Modal	•	•	•	•	•	•			•
Harmonic response	•	•	•	•	•				•
Flexible dynamics	•	•	•						•
Linear buckling	•	•	•	•	•	•			•
Random vibration	•	•	•						•
Shape optimization	•	•	•	•	•	•			•
Steady-state thermal	•	•		•	•	•			•
Transient thermal	•	•		•					•
Magnetostatics	•						•		•
Rigid dynamics								•	
Static Structural–Pre-Processing									
Body Loads									
Acceleration	•	•	•	•	•	•			•
Standard earth gravity	•	•	•	•	•	•			•
Rotational velocity	•	•	•	•	•	•			•
Loads									
Pressure	•	•	•	•	•	•			•
CFX pressure (one-way FSI)	[S-1]	[S-1]	[S-1]	[S-1]	[S-1]				[S-1]
Hydrostatic pressure	•	•	•	•	•	•			•
Force	•	•	•	•	•	•			•
Remote force	•	•	•	•	•	•			•
Bearing load	•	•	•	•	•	•			•
Bolt (pretension)	•	•	•	•	•	•			•
Moment	•	•	•	•	•	•			•
Generalized plane strain	•	•	•	•	•	•			•
Line pressure	•	•	•	•	•	•			•
Motion loads	•	•	•	•	•	•			•



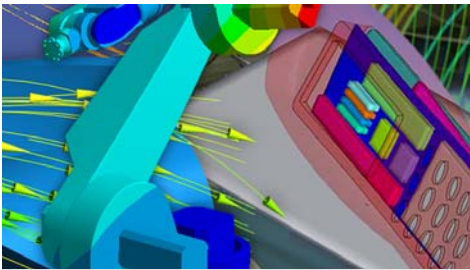
Complete Simulation Solutions

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Supports									
Fixed support	•	•	•	•	•	•			•
Displacement	•	•	•	•	•	•			•
Remote displacement	•	•	•	•	•	•			•
Frictionless support	•	•	•	•	•	•			•
Compression only support	•	•	•	•	•	•			•
Cylindrical support	•	•	•	•	•	•			•
Elastic support	•	•	•	•	•	•			•
Conditions									
Joint condition								•	
Thermal condition	•	•	•	•	•	•			•
FSI interface	•	•	•	•	•				•
Static Structural – Post-Processing									
Stress tool	•	•	•	•	•	•			•
Stress	•	•	•	•	•	•			•
Strain	•	•	•	•	•	•			•
Deformation	•	•	•	•	•	•			•
Fatigue tool (requires fatigue module)	•	•	•	•	•	•			•
Contact tool	•	•	•	•	•				•
Probe	•	•	•	•	•	•			•
prestress (static)	•	•	•	•	•	•			
prestress (static)	•	•	•	•	•	•			
Static Structural – Analysis Settings									
Step controls	•	•	•	•	•	•			•
Solver controls	•	•	•	•	•	•			•
Large deflection	•	•	•	[S-2]	[S-2]				•
Inertial relief	•	•	•	•	•	•			•
Nonlinear Controls									
Force Convergence	•	•	•	•	•	•			•
Moment Convergence	•	•	•	•	•	•			•
Displacement Convergence	•	•	•	•	•	•			•
Rotation Convergence	•	•	•	•	•	•			•
Line Search	•	•	•	•	•	•			•
Flexible Dynamics – Pre-Processing									
Body Loads									
Acceleration	•	•	•						•
Standard Earth gravity	•	•	•						•
Rotational velocity	•	•	•						•
Loads									
Pressure	•	•	•						•
CFX pressure (one-way FSI)	[S-1]	[S-1]	[S-1]	[S-1]	[S-1]				[S-1]
Hydrostatic pressure	•	•	•						•
Force	•	•	•						•
Remote force	•	•	•						•
Bearing load	•	•	•						•
Bolt (pretension)	•	•	•						•
Moment	•	•	•						•
Line pressure	•	•	•						•
Motion loads	•	•	•						•
Supports									
Fixed support	•	•	•						•
Displacement	•	•	•						•
Remote displacement	•	•	•						•
Frictionless support	•	•	•						•
Compression-only support	•	•	•						•

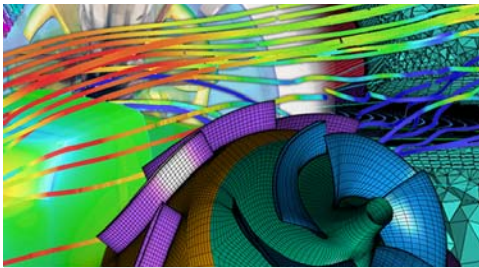


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Cylindrical support	•	•	•						•
Elastic support	•	•	•						•
Conditions									
Joint condition								•	
Thermal condition	•	•	•						•
FSI interface	•	•	•						•
Initial condition	•	•	•						•
Acceleration									
Stress tool	•	•	•						•
Stress	•	•	•						•
Strain	•	•	•						•
Deformation	•	•	•						•
Contact tool	•	•	•						•
Probe	•	•	•						•
Flexible Dynamics – Analysis Settings									
Step controls	•	•	•						•
Solver controls	•	•	•						•
Large deflection	•	•	•						•
Nonlinear Controls									
Force convergence	•	•	•						•
Moment convergence	•	•	•						•
Displacement convergence	•	•	•						•
Rotation convergence	•	•	•						•
Line search	•	•	•						•
Damping Controls									
Beta damping	•	•	•						•
Numerical damping	•	•	•						•
Modal – Pre-Processing									
Supports									
Fixed support	•	•	•	•	•	•			•
Displacement	•	•	•	•	•	•			•
Remote displacement	•	•	•	•	•	•			•
Frictionless support	•	•	•	•	•	•			•
Compression-only support	•	•	•	•	•	•			•
Cylindrical support	•	•	•	•	•	•			•
Elastic support	•	•	•	•	•	•			•
Conditions									
Initial condition	•	•	•	•	•	•			•
Modal – Post-Processing									
Stress	•	•	•	•	•	•			•
Strain	•	•	•	•	•	•			•
Deformation	•	•	•	•	•	•			•
Create PSD analysis	•	•	•						•
Modal – Analysis Settings									
Option	•	•	•	•	•	•			•
Solver controls	•	•	•	•	•	•			•
Harmonic Response – Pre-Processing									
Body Loads									
Acceleration	•	•	•	•	•				•
Loads									
Pressure	•	•	•	•	•				•
Force	•	•	•	•	•				•
Remote force	•	•	•	•	•				•
Bearing load	•	•	•	•	•				•
Moment	•	•	•	•	•				•
Line pressure	•	•	•	•	•				•
Supports									
Fixed support	•	•	•	•	•				•

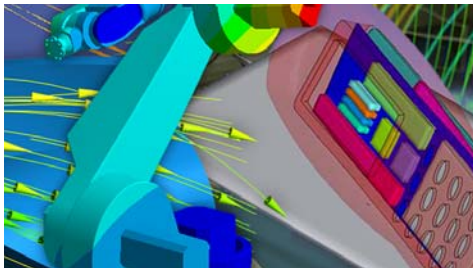


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Displacement	•	•	•	•	•				•
Remote displacement	•	•	•	•	•				•
Frictionless support	•	•	•	•	•				•
Compression-only support	•	•	•	•	•				•
Cylindrical support	•	•	•	•	•				•
Elastic support	•	•	•	•	•				•
Harmonic Response – Post-Processing									
Stress	•	•	•	•	•				•
Strain	•	•	•	•	•				•
Deformation	•	•	•	•	•				•
Frequency/phase response	•	•	•	•	•				•
Harmonic Response – Analysis Settings									
Options									
Solution method (full)	•	•	•						
Solution method (mode superposition)	•	•	•	•	•				
Damping controls									
Constant damping coefficient	•	•	•						•
Beta damping	•	•	•						•
Linear Buckling – Post-Processing									
Stress	•	•	•	•	•	•			•
Strain	•	•	•	•	•	•			•
Deformation	•	•	•	•	•	•			•
Linear Buckling – Analysis Settings									
Options	•	•	•	•	•	•			•
Random Vibration – Pre-Processing									
Loads									
PSD load	•	•	•						•
Supports									
Fixed support	•	•	•						•
Conditions									
Initial condition	•	•	•						•
Random Vibration – Post-Processing									
Stress	•	•	•						•
Strain	•	•	•						•
Deformation	•	•	•						•
Random Vibration – Analysis Settings									
Options	•	•	•						•
Damping controls									
Beta damping	•	•	•						•
Shape Optimization – Pre-Processing									
Body loads									
Acceleration	•	•	•	•	•	•			•
Standard Earth gravity	•	•	•	•	•	•			•
Rotational velocity	•	•	•	•	•	•			•
Loads									
Pressure	•	•	•	•	•	•			•
Hydrostatic pressure	•	•	•	•	•	•			•
Force	•	•	•	•	•	•			•
Remote force	•	•	•	•	•	•			•
Bearing load	•	•	•	•	•	•			•
Moment	•	•	•	•	•	•			•
Line pressure	•	•	•	•	•	•			•
Motion loads	•	•	•	•	•	•			•
Supports									
Fixed support	•	•	•	•	•	•			•
Displacement	•	•	•	•	•	•			•
Remote displacement	•	•	•	•	•	•			•



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Frictionless support	•	•	•	•	•	•			•
Compression-only support	•	•	•	•	•	•			•
Cylindrical support	•	•	•	•	•	•			•
Elastic support	•	•	•	•	•	•			•
Conditions									
Joint conditions								•	
Thermal condition	•	•	•	•	•	•			•
		Shape Optimization – Post-Processing							
Shape finder	•	•	•	•	•	•			•
		Shape Optimization – Analysis Settings							
Solver Controls	•	•	•	•	•	•			•
		Steady State Thermal – Pre-Processing							
Temperature	•	•		•	•	•			•
Convection	•	•		•	•	•			•
Radiation	•	•		•					•
CFX temperature	[S-1]	[S-1]		[S-1]	[S-1]				[S-1]
CFX convection	[S-1]	[S-1]		[S-1]	[S-1]				[S-1]
Heat									
Heat flow	•	•		•	•	•			•
Perfectly insulated	•	•		•	•	•			•
Heat flux	•	•		•	•	•			•
Internal heat generation	•	•		•	•	•			•
Conditions									
Initial condition	•	•		•	•	•			•
		Steady-State Thermal – Pre-Processing							
Thermal	•	•		•	•	•			•
Probe	•	•		•	•	•			•
		Steady-State Thermal – Analysis Settings							
Step controls	•	•		•	•	•			•
Solver controls	•	•		•	•	•			•
Nonlinear controls	•	•		•	•	•			•
		Transient Thermal – Pre-Processing							
Temperature	•	•		•					•
Convection	•	•		•					•
Radiation	•	•		•					•
CFX temperature	[S-1]	[S-1]		[S-1]					[S-1]
CFX convection	[S-1]	[S-1]		[S-1]					[S-1]
Heat									
Heat flow	•	•		•					•
Perfectly insulated	•	•		•					•
Heat flux	•	•		•					•
Internal heat generation	•	•		•					•
Conditions									
Initial condition	•	•		•					•
		Transient Thermal – Post-Processing							
Thermal	•	•		•					•
Probe	•	•		•					•
		Transient Thermal – Analysis Settings							
Step controls	•	•		•					•
Solver controls	•	•		•					•
Nonlinear controls	•	•		•					•
		Magnetostatic – Pre-Processing							
Magnetic flux parallel	•						•		•
Conductor	•						•		•
		Magnetostatic – Post-Processing							
Electromagnetic	•						•		•
Probe	•						•		•



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Magnetostatic – Analysis Settings

Solver controls	•						•		•
Nonlinear controls	•						•		•

Rigid Dynamic – Pre-Processing

Body loads

Acceleration								•	
Standard Earth gravity								•	

Conditions

Joint condition								•	
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Rigid Dynamic – Post-Processing

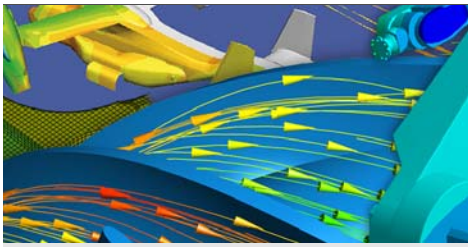
Deformation probe								•	
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Rigid Dynamic – Analysis Settings

Step controls								•	
Nonlinear controls								•	

Engineering Data Material Models

Young's modulus	•	•	•	•	•	•			•
Poisson's ratio	•	•	•	•	•	•			•
Orthotropic elasticity	•	•	•	•	•	•			•
Density	•	•	•	•	•	•			•
Reference temperature	•	•	•	•	•	•			•
Thermal expansion	•	•	•	•	•	•			•
Constant damping coefficient	•	•	•	•	•	•			•
Material damping factor	•	•	•	•	•	•			•
Temperature-dependent materials	•	•	•	•	•	•			•
Alternating stress	•	•	•	•	•	•			•
Strain life parameters	•	•	•	•	•	•			•
Tensile yield strength	•	•	•	•	•	•			•
Compressive yield strength	•	•	•	•	•	•			•
Tensile ultimate strength	•	•	•	•	•	•			•
Compressive ultimate strength	•	•	•	•	•	•			•
Uniaxial test data	•	•	•		•				•
Biaxial test data	•	•	•		•				•
Shear test data	•	•	•		•				•
Volumetric test data	•	•	•		•				•
Neo-Hookean	•	•	•		•				•
Mooney–Rivlin 2-parameter	•	•	•		•				•
Mooney–Rivlin 3-parameter	•	•	•						•
Mooney–Rivlin 5-parameter	•	•	•						•
Mooney–Rivlin 9-parameter	•	•	•						•
Polynomial 1-order	•	•	•						•
Polynomial 2-order	•	•	•						•
Polynomial 3-order	•	•	•						•
Yeoh 1-order	•	•	•						•
Yeoh 2-order	•	•	•						•
Yeoh 3-order	•	•	•						•
Ogden 1-order	•	•	•		•				•
Ogden 2-order	•	•	•		•				•
Ogden 3-order	•	•	•		•				•
BISO	•	•	•		•				•
MISO	•	•	•						•
BKIN	•	•	•		•				•
MKIN	•	•	•						•
Thermal conductivity	•	•		•	•	•			•
Orthotropic conductivity	•	•		•	•				•
Specific heat	•	•		•	•				•
Relative permeability	•						•		•
Linear orthotropic permeability	•						•		•
Linear hard magnetic material	•						•		•



Elements exposed by ANSYS Workbench (element name)

For all software packages listed, capabilities depend upon physics being modeled and license type.

Mesh elements

Meshing-facet (MESH200)

Electromagnetic elements

– 3-D 20-node magnetic solid (SOLID117)

– Current source (SOURC36)

Structural Elements

3-D linear finite strain beam

Spring damper (COMBIN14)

Follower load (FOLLOW201)

Structural mass (MASS21)

2-D structural solid (PLANE42)

3-D structural solid (SOLID45)

2-D 4-node structural solid (PLANE182)

2-D 8-node or 6-node structural solid (PLANE183)

Pretension (PRETS179)

4-node finite strain shell (SHELL181)

3-D 20-node structural solid or layered solid (SOLID186)

3-D 10-node tetrahedral structural solid (SOLID187)

3-D 10-node tetrahedral structural solid (SOLID92)

3-D 20-node structural solid (SOLID95)

2-D structural surface effect (SURF153)

3-D structural surface effect (SURF154)

3-D structural surface line load effect (SURF156)

Multipoint constraint element (MPC184)

3-D 8-node structural solid or layered solid (SOLID185)

3-D 8-node layered solid shell (SOLID190)

Thermal Elements

3-D conduction bar (LINK33)

2-D thermal solid (PLANE55)

2-D 8-node thermal solid (PLANE77)

Thermal shell (SHELL57)

3-D thermal solid (SOLID70)

3-D 10-node tetrahedral thermal solid (SOLID87)

3-D 20-node thermal solid (SOLID90)

2-D thermal surface effect (SURF151)

3-D thermal surface effect (SURF152)

Contact Elements

2-D 2-node surface-to-surface contact (CONTA171)

2-D 3-node surface-to-surface contact (CONTA172)

3-D 4-node surface-to-surface contact (CONTA173)

3-D 8-node surface-to-surface contact (CONTA174)

2-D/3-D node-to-surface contact (CONTA175)

2-D target segment (TARGE169)

3-D target segment (TARGE170)

FOOTNOTES

[S-1] Requires both an ANSYS license and a CFX Post license

[S-2] Only for beam and shell elements

[S-3] Also requires the ANSYS Fatigue module

[S-4] Depends upon physics being modeled and license type



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