

Comsol Applications

| Application | Comsol Multiphysics | Reaction Engineering | CFD |
|------------------------------------|---------------------|----------------------|-----|
| AC/DC | | | |
| Electrostatics | X | X | X |
| Electric Currents | X | X | X |
| Acoustics | | | |
| Pressure Acoustics | X | X | X |
| Chemical Species Transport | | | |
| Transport of Diluted Species | X | X | X |
| Transport of Concentrated Species | | X | X |
| Nernst-Planck Equations | | X | |
| Species Transport in Porous Media | | X | |
| Reaction Engineering | | X | |
| Fluid Flow (see below, too) | | | |
| Single-Phase | | | |
| Laminar | X | X | X |
| Porous Media and Subsurface flow | | | |
| Brinkman Equations | | X | X |
| Darcy's Law | | X | X |
| Free and Porous Media | | X | X |
| Heat Transfer | | | |
| Solids | X | X | X |
| Fluids | X | X | X |
| Porous Media | | X | X |
| Joule Heating | X | X | X |
| Structural Mechanics | | | |
| Solid Mechanics | X | X | X |
| Mathematics | | | |
| PDE Interface | | | |
| Coefficient | X | X | X |
| General Form | X | X | X |
| Weak Form | X | X | X |
| Weak Form Boundary | X | X | X |
| Weak Form Edge | X | X | X |
| Weak Form Point | X | X | X |
| ODEs and DAEs | X | X | X |
| Optimization and Sensitivity | | | |
| Sensitivity | X | X | X |
| Classical PDEs | | | |
| Helmholtz Eq. | X | X | X |
| Laplace Eq. | X | X | X |
| Poisson's Eq. | X | X | X |
| Wave Eq. | X | X | X |
| Deformed Mesh | | | |
| Deformed Geometry | X | X | X |
| Moving Mesh (ale) | X | X | X |
| Wall Distance | X | X | X |
| In CFD only | | | |
| Single Phase Flow | | | |
| Turbulent Flow | | | |
| k-ε (spf) | | | X |
| low Re k-ε (spf) | | | X |
| Spalart-Allmaras (spf) | | | X |
| Creeping Flow | | | X |
| Rotating Machinery | | | |
| Laminar Flow | | | X |
| Turbulent Flow, k-ε | | | X |
| Thin-Film Flow | | | |
| Lubrication Shell | | | X |
| Multiphase Flow | | | |
| Bubbly Flow | | | |
| Laminar | | | X |
| Turbulent | | | X |
| Mixture Model | | | |
| Laminar | | | X |
| Turbulent | | | X |
| Two-Phase Flow, Level Set | | | |
| Laminar | | | X |
| Turbulent | | | X |
| Two-Phase Flow, Phase Field | | | |
| Laminar | | | X |
| Turbulent | | | X |
| Porous Media & Subsurface Flow | | | |
| Non-Isothermal Flow | | | |
| Laminar Flow | | | X |
| Turbulent Flow | | | |
| k-ε (spf) | | | X |
| Low Re k-ε | | | X |
| Spalart-Allmaras | | | X |
| Heat Transfer | | | |
| Conjugate HT | | | |
| Laminar | | | X |
| Turbulent | | | |
| Turbulent k-ε | | | X |
| Low Re k-ε | | | X |
| Spalart-Allmaras | | | X |
| Mathematics | | | |
| Moving Interface | | | |
| Level Set | | | X |
| Phase Field | | | X |