Computer Models
For
Fire and Smoke

Model Name:	CFX
Version:	CFX-4 and CFX-5
Classification:	Field model.
Very Short Description:	General-purpose fluid dynamics software, applicable to dispersion, fire and explosion within internal and/or external environments.
Modeler(s), Organization(s):	AEA Technology plc.
User's Guide:	CFX-4.3 User Manual, AEA Technology, Harwell, UK, 2000. CFX-5 User Manual, AEA Technology, Harwell, UK, 2000.
Technical References:	See http://www.aeat.com/cfx.
Validation References:	Wilkes N S, Alderton J H and Macintosh L M, "A comparison of predictions with experimental data for a fire in a hospital ward. 1: Preliminary predictions", AERE-M3712, 1988. Ciofalo M and Collins M W, "Predictive study of heat transfer to an incompressible fluid past a downstream-facing step in turbulent flow", International Journal of Heat and Technology, Volume 6, pages 8-33, 1988. Simcox S, Wilkes N S & Jones I P, "Computer Simulation of the Flows of Hot Gases from the Fire at King's Cross Underground Station", Fire Safety Journal, Vol.18, pp 49-73, 1992.

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Availability: Commercial, from CFX International, AEA Technology Engineering Software, 8.19 Harwell, Didcot, Oxfordshire OX11 0QJ, United Kingdom.
Tel. +44(0)1235-433447, fax +44(0)1235-432989, email cfx.info@aeat.com. Other offices exist worldwide. See http://www.aeat.com/cfx.

Price: On application.

Necessary Hardware: We support Windows NT and most Unix platforms.

Computer Language: The software is provided in executable format.

Contact Information: For technical information contact Dr Yehuda Sinai, CFX International, AEA Technology Engineering Software, 8.19 Harwell, Didcot, Oxfordshire OX11 0RA, United

Kingdom. Tel. +44(0)1235-432865, fax +44(0)1235-432989, email yehuda.sinai@aeat.com.

Detailed Description:

Several solvers are available in the CFX suite: CFX-4, CFX-TASCFLOW, and CFX-5. The first two are multi-block, body-fitted coordinate packages. CFX-5 is our main focus of development, and in contrast, is a code which offers automatic generation of unstructured meshes, and a coupled solver. This means that pre-processing is much easier, and convergence is quicker.

The software can be used for assessing fire dynamics, smoke movement, fire-structure issues, and fire suppression.

The following specifications apply to the multi-block codes: Graphical User Interface for mesh generation and post processing, CAD interface, time dependent or steady state heat and mass transfer, two or three dimensions, body fitted coordinates, heat transfer in solid regions, porous media approximation, turbulence models (k-epsilon, RNG, low-Reynolds Number models, algebraic stress, Differential Stress, Differential Flux), Large Eddy Simulation, compressibility, additional scalar transport equations, Eulerian multi-fluid model, transient Lagrangian particle transport, gaseous combustion (Eddy Dissipation, PDF, flamelet), soot model, thermal radiation in non-participating and participating media (Monte Carlo and Discrete Transfer), chemical kinetics, gaseous deflagration model, transonic and supersonic flows, FORTRAN interface, higher-order temporal and spatial differencing, multi-block, unmatched grids, moving grids, parallel processing.

Specification for CFX-5: Graphical User Interface for mesh generation and post processing, CAD interface, automatic mesh generation, mesh adaption, unstructured hybrid meshes, command language option, expression language for model definition and generalisation, coupled solver, time-dependent or steady state multicomponent heat and mass transfer, heat transfer in solid regions, turbulence models (k-epsilon, RNG, Reynolds Stress), compressibility, additional scalar transport equations, multiphase flows, transonic and supersonic flows, higher-order spatial differencing, parallel processing.