Computer Models
For
Fire and Smoke

Model Name:	CIFI
Version:	10.1
Classification:	Zone model (multiroom)
Very Short Description:	A model to predict the flow of smoke and fire gases into a compartmented structure and hazards to people.
Modeler(s), Organization(s):	Xavier Bodart, Michel Curtat, Centre Scientifique et Technique du Bâtiment (CSTB)
User's Guide:	-----
Technical References:	Main description in : "Voyage au centre de CIFI", Xavier Bodart, CSTB report, 1990.
Validation References:	Several CSTB reports, by Xavier Bodart
Availability:	no
Price:	used only at CSTB
Necessary Hardware:	Work station HP Risc
Computer Language:	Fortran + Ratfive
Size:	~ 1MB (+ links to math. and graphic Libraries)
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Detailed Description:

- In each room or volume: lower and upper gas layers, flame and plume zones
- Differential equations derived from conservation of mass, energy and species
- Prediction of gas zones temperatures, interface heights, mass fluxes through openings, heat fluxes, temperature profiles in the walls …
- Ventilation : Natural (vertical and/or horizontal openings, building leakages) and /or mechanical (fans and ducts)
- Combustion in upper layer can be considered
- Retained chemical species : unburnt fuel, O_2, CO_2. Concentration of CO is predicted if the source term is given a production law.
- Options exist concerning entrainment laws and conductive thermal transfer.
- Gas entrainment through openings.
- Tenability criteria for people exposed to heat and toxic gas
- Graph outputs