

# Computer Models For Fire and Smoke

<i>Model Name:</i>	NAT
<i>Version:</i>	9
<i>Classification:</i>	Zone model
<i>Very Short Description:</i>	A model to predict the thermal effects on structural elements or equipment in case of a developed fire in a single compartment
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<i>User's Guide:</i>	-----
<i>Technical References:</i>	“Prévision par le calcul des sollicitations thermiques”, cahier CSTB 2565, 1992 and cahier CSTB 2727, 1994
<i>Validation References:</i>	CSTB reports
<i>Availability:</i>	no
<i>Price:</i>	used only at CSTB
<i>Necessary Hardware:</i>	PC or work station
<i>Computer Language:</i>	Fortran
<i>Size:</i>	6000 instructions + math. library
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*Detailed Description:*

- One mixed gas zone in the compartment

- Differential equations derived from conservation of mass, energy and species
- Prediction of the gas zone temperature, mass fluxes through openings, heat fluxes, temperature profiles in the walls and in exposed element ...
- Ventilation : natural (vertical and/or horizontal openings, building leakages) and /or mechanical
- Horizontal and vertical openings (can be opened or closed during the fire. If closed, can be ruined by fire effects)
- Chemical species : unburnt fuel, O<sub>2</sub>, CO<sub>2</sub>.