Computer Models
For
Fire and Smoke

Model Name:	FIRE SIMULATOR (FPETOOL)
Version:	3.2
Classification:	Compartment zone fire model
Very Short Description:	Compartment fire model. Single room and vent model. Predictions include smoke temperature and interface, gases and visibility in smoke, sprinkler and detector activation
Modeler(s), Organization(s):	Harold E. Nelson, Scot Deal and Charles Arnold National Institute of Standards and Technology
User's Guide:	FPETOOL User's Guide; Nelson, H. E., NISTIR 4439, NIST 1990
Technical References:	FPETOOL: Fire Protection Tools for Hazard Estimation, Nelson, H. E., NISTIR 4380, NIST 1990
	Technical Reference Guide for FPEtool Version 3.2, NISTIR 5486, S. Deal NIST 1994
Validation References:	FPETOOL: Fire Protection Tools for Hazard Estimation, Nelson, H. E., NISTIR 4380, NIST 1990
	Comparing Compartment Fires with Compartment Fire Models, Nelson, H. E. and Deal, S, FIRE SAFETY SCIENCE - PROCEEDINGS OF THE THIRD INTERNATIONAL SYMPOSIUM, International Association for Fire Safety Science, 1991
	Comparison of FPETool: FIRE SIMULATOR With Data From Full Scale Experiments, Vettori, R. L. and Madrzykowski, NISTIR 6470, NIST 2000
Availability:	Available as an integral element of the collection FPETOOL from either:

Building and Fire Research Laboratory, NIST or
National Fire Protection Association

Price: $20 US

Necessary Hardware: 286 or better computer with MSDOS capability

Computer Language: QUICK BASIC

Size: 2.17 MB

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Detailed Description:

FIRE SIMULATOR is an integral element of the collection FPETOOL. FPETOOL is a
computerized package of relatively simple engineering equations and models useful in
estimating potential fire hazard and the response of the involved space and fire protection
systems to the developing hazard.

FIRE SIMULATOR is the single largest and comprehensive of FPETOOL. FIRE
SIMULATOR is a fire condition estimating model designed to estimate the temperature and
volume of the smoke layer produced by a fire, the venting of hot gas and combustion
products from openings in that room, the response of heat actuated devices, sprinklers or
heat detectors, an d smoke detectors inside an environment, the oxygen, carbon monoxide,
and carbon dioxide concentrations in the smoke, and the effects available oxygen on the
combustion process.

FIRE SIMULATOR is designed to estimate conditions in both the pre- and post-flashover
realms of burning.

FIRE SIMULATOR is an interactive program, prompting the user to make entries as needed
and producing both printed and spreadsheet outputs.