

# Computer Models For Fire and Smoke

<i>Model Name:</i>	INSTAI
<i>Version:</i>	Version 1
<i>Classification:</i>	Structural Finite Difference
<i>Very Short Description:</i>	Model for the calculation of the fire resistance of insulated, circular hollow steel columns.
<i>Modeler(s), Organization(s):</i>	T.T. Lie, National Fire Laboratory, Institute for Research in Construction, National Research Council of Canada.
<i>User's Guide:</i>	-----
<i>Technical References:</i>	Lie, T.T., "A Procedure to Calculate the Fire resistance of Structural Members," Fire and Materials, Vol. 8, No. 1, 1984.
<i>Validation References:</i>	-----
<i>Availability:</i>	Not Available
<i>Price:</i>	N/A
<i>Necessary Hardware:</i>	-----
<i>Computer Language:</i>	FORTRAN 77
<i>Size:</i>	80 kB
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*Detailed Description:*

*Input:*

Dimension of steel and insulation, thermal properties of insulation.

*Output:*

Average steel temperature at selected times during the exposure to fire.

*Assumptions:*

INSTAI calculates, using a finite difference method, the average steel temperature of insulated circular hollow steel columns, during exposure to the North American standard fire (any other fire can be substituted). The fire resistance is determined by calculating the time it takes to reach a specific critical steel temperature.