

Computer Models For Fire and Smoke

<i>Model Name:</i>	COFIL
<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 loaded circular hollow steel columns filled with plain concrete.
<i>Modeler(s), Organization(s):</i>	T.T. Lie and M. Chabot, 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. and Chabot, M., "A Method to Predict the Fire Resistance of Circular Concrete Filled Hollow Steel Columns," <i>Journal of Fire Protection Engineering</i> , Vol. 2, No. 4, 1990. Kodur, V.R., Lie, T.T., "Fire performance of concrete-filled hollow steel columns," <i>Journal of Fire Protection Engineering</i> , 7, (3), pp. 89-98, 1995
<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>	50 kB
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Detailed Description:

Input:

Diameter of steel column, steel wall thickness, steel and concrete strength, effective length of column, applied load and load eccentricity.

Output:

Time to failure of the column (fire resistance).

Assumptions:

COFIL calculates, using a finite difference method, the temperature history in the column and, using a finite element method, the strength of the column during exposure to the North American standard fire (any other fire can be substituted). The fire resistance is determined by calculating the time at which the column can no longer support the applied load.

Limitations:

Concrete strength not greater than 40 MPa at 28 days. Fire resistance not greater than 2 hours. Loads not greater than the factored resistance of the concrete core.