

# Computer Models For Fire and Smoke

<i>Model Name:</i>	CIRCON
<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, reinforced concrete columns with circular cross section.
<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. and Celikkol, B., "Method to Calculate the Fire Resistance of Circular Reinforced Concrete Columns," ACI Materials Journal, Vol. 88, No. 1, 1991.
<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>	100 kB
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*Detailed Description:*

*Input:*

Diameter of Concrete section and bar reinforcement, number of bars, cover to the steel, column effective length, strength of concrete and steel and eccentricity of the load.

*Output:*

Strength of column as function of time during exposure.

*Assumptions:*

CIRCON 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.