I-DEAS Online Help

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Simulation: TMG Thermal Analysis User's Guide

Defining an Interpolation Relationship

Use *Interpolation Relationship* to define a functional relationship between thermal model parameters. The functional dependence is defined as a series of discrete data pairs, with linear interpolation at intermediate points; use *Create Tables...* to define the table. The Interpolation Relationship supercedes the original value for the parameter.

Locate the icon.

Select the thermal model parameter which is to be varied (the dependent variable); if this parameter is an element property or attribute, select the applicable elements.

Select the thermal model parameter which is to be used as the reference (the independent variable).

In almost all cases, select *Use Affected Element as Reference*. The exceptional case is when you want to vary the boundary condition on the affected elements as a function of some other element's attribute; for example, to apply a variable heat load on "heater" elements as a function of the temperature of a separate "sensor" element. Only a single element can be used as the Reference Element.

Special Multiplying Factor

A multiplying factor can be specified for the interpolated variable. Some special codes define specific multiplying factors are:

- *Area* of the affected elements will multiply the interpolated variable; specify **1E36** as the multiplying factor.

- The *Total* option will redistribute the interpolated variable (e.g. heat load) base on the affected elements volume or area; specify **2E36** as the multiplying factor. For this option, 3D and 2D elements can not be mixed as affected elements but 2D and beam elements can. If all affected elements are non-geometric elements, the interpolated variable is evenly distributed among them.

- *Volume* of the affected elements will multiply the interpolated variable; specify **3E36** as the multiplying factor. For planar and beam elements the volume is calculated by multiplying the length or area by the cross-sectional area or thickness.

Notes on Interpolation Relationship

- If you are using the element center method (*instead of the recommended CG method)*, when you are modeling variable material properties such as thermal conductivity or specific heat, you should always create surface coat elements at any element boundaries which are shared with elements of a different material.

- If the dependent variable is time, the table is assumed to be periodic, with a period equal to the largest defined time value.