

Defining a Space Enclosure

Use *Space Enclosure* to create a large radiative enclosure around the model. Use this enclosure to model objects which radiate to an ambient environment with constant or time varying temperatures.

A Space Enclosure is a TMG entity which during the analysis constructs a huge cube, tetrahedron, or cylinder around the model. The Space Enclosure is comprised of very large temporary surface elements. View factors can then be calculated to these surface elements. They are automatically merged into a single calculation point prior to solving.

The Space Enclosure entity is called SPACE. Due to the special nature of the Space Enclosure, do not use the name SPACE for your entities.

Space Enclosure Geometry

Cubic is the default form of the Space Enclosure. The cubic Space Enclosure yields better precision in view factor calculations. This is the recommended shape to use with any model except axisymmetric ones.

The cubic Space Enclosure is especially recommended for a symmetric model. A model is symmetric when both the geometry and the boundary conditions are symmetric. In this case, radiation to a tetrahedral Space Enclosure creates a non-symmetric boundary condition and its effects may be large enough to alter the symmetric temperature pattern of the solution.

By default, six very large square surface elements constitute the cubic Space Enclosure. You can change this by specifying a number of elements per edge, this will increase the precision of the shadowing checks.

Axisymmetric Space Enclosure

If there are axisymmetric elements in the model, the space enclosure will be automatically constructed as a large cylinder, using the faceting criterion specified under *Radiation Control, Advanced Parameters*. In this way axisymmetry can be exploited in computing view factors to Space.

Tetrahedron Space Enclosure

The tetrahedron Space Enclosure is comprised of four very large triangular surface elements. This was the geometry of the Space enclosure in prior releases and is kept to ensure results are consistent with old models.

Post Processing Space Enclosure

The Space Enclosure elements exist only during solve time. You cannot visualize them in I-DEAS. However, when you specify a label for the Space Enclosure you can retrieve information about this specific element by creating an *Element Reporting* entity (see the article *Element Reports* for details).

While checking the model, a warning is issued if the specified Element Label interferes with existing element labels. At run time, if the Space Enclosure Element Label interferes with existing elements, the Space Enclosure Element Label is changed and a warning message is issued specifying the new Element Label.

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