



Update Guide Release 2020.1

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Lambda Research Corporation
25 Porter Road
Littleton, MA 01460
USA

www.lambdares.com
support@lambdares.com

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INTRODUCTION

This document serves as a guide for the new features and changes in TracePro 2020.1. This release has enhancements in the **Geometry|Primitive Solid|Thin Sheet** feature. This release also fixes several problems reported by TracePro users. See the [TracePro Revision History](http://www.lambdare.com) at www.lambdare.com for more details on problem resolutions.

WHAT'S NEW IN TRACEPRO 2020.1?

Changes in TracePro 2020.1 are summarized as follows:

- Geometry|Primitive Solid|Thin Sheet enhancements.

THIN SHEET ENHANCEMENTS

The **Thin Sheet** tab of the **Insert Primitive Solid** dialog box, accessed from the **Geometry** menu, has been enhanced to include more boundary shapes. Also, a Thin Sheet can now be modified after it has been created, using the new *Modify* button as for other TracePro geometry. The complete set of boundary shapes is:

- Circle
- Ellipse
- Rectangle
- Regular Polygon
- Irregular Polygon

The Irregular Polygon is the shape produced by the Thin Sheet dialog box prior to TracePro 2020.1.

Except for the irregular polygon, the boundary is specified by:

- Dimensions
- Center position
- Rotation angles

Creating a thin sheet object other than an irregular polygon with no rotation angles results in a surface with its normal along the +Z direction. Any subsequent sweep or revolve operation along the surface normal will thus be in the +Z direction.

A **regular polygon** is one with equal length sides and equal angles, e.g. equilateral triangle, square, pentagon, hexagon, etc. The radius is measured from the center to a vertex, i.e. the radius of a circumscribed circle.

An **irregular polygon** is specified using at least three different positions consisting of X, Y and Z values. All the positions must lie in the same plane. X, Y and Z are in the current Model Units. The positions are connected by linear edges, with the last point being connected to the first point to close the boundary. This closed loop is then covered with a surface and made double-sided. Note: The surface normal of an irregular polygon thin sheet follows the right-hand rule using the "curl" of the sequence of positions.

Thin sheets may be used as reflectors or reference surfaces, and may be Extruded (**Edit|Surface>Sweep**) or Revolved (**Edit|Surface>Revolve**) to create normal thick objects, such as prisms and light pipes.

Thin sheets can also be used as “observation” surfaces available for viewing by an Irradiance Map as rays propagate through the model, such as reference planes within a light pipe.

To create a new thin sheet, first select the **Primitive Solid** command from the **Geometry** menu. Then click on the **Thin Sheet** tab and enter the appropriate data. Finally, click *Insert*, and the Thin Sheet will be created.

Limitations

Since a Thin Sheet has no thickness or volume, applying material properties to the thin sheet can lead to errors during a ray-trace. For this reason, application of the following property types to thin sheets is not allowed: Material, Mueller Matrix, Gradient Index, Bulk Scatter, and RepTile. You should not apply a surface property with non-zero transmittance or BTDF, as this may also cause ray tracing errors.