

Calculating Vessel Surface Area for ESLIN R-Board

All ESLIN Industrial Insulation Board materials are currently supplied in one square meter panels (39.37” by 39.37”). The Board material is available in two forms: Flat (or, F-Board) and Rounded (or, R-Board). The “rounded” board is pre-curved to fit the exact curvature of any oversized pipe (42” or larger), tank, vessel or heat exchanger. ESLIN is the only manufacturer that offers a high density board material in a large pre-formed form. Most other solid insulations are supplied in a smaller board or scored-block form that has square edges and will not form well to a rounded surface. The square edges result in voids that negatively affect the performance of the insulation. ESLIN R-Board is manufactured to any custom curvature. Once the raw board comes of the production line, the edges are cut at the appropriate angle so that each piece will fit up perfectly to the adjacent piece.

There is one very important rule to remember when calculating square footage of a vessel. To get the proper amount of material to cover the vessel, you must calculate the square footage as if the selected thickness of insulation has already been installed i.e.: the outside diameter (OD) is the vessel diameter plus the insulation thickness. For example: A 60” OD cylinder is going to need three (3) inch thick ESLIN. The correct OD for calculating purposes is 60” + 3” + 3” = 66”.

We’re sure everyone well remembers their geometry and trigonometry classes but, just in case, here are some helpful equations to use for calculating surface area:

- D = Diameter
- R = Radius (line segment from center of circle to its perimeter)
- H = Height (for vessel, tower or drum, this is typically from tangent to tangent — always refer to actual vessel drawing.)
- Circumference = πD (distance around circle)
- PI or “ π ” = 3.1416
- Area of a circle = πR^2 or $2\pi RH$

Area Calculations:

- Cylindrical portion of a vessel, tower, tank, etc. = $2\pi RH$
- Elliptical Head (2:1) = $1.084D^2$
- Cone-roof tank top = πRS where S is the “slant height” of the roof.
 - Slant Height is the distance from any point on a circle to the apex of the cone.

