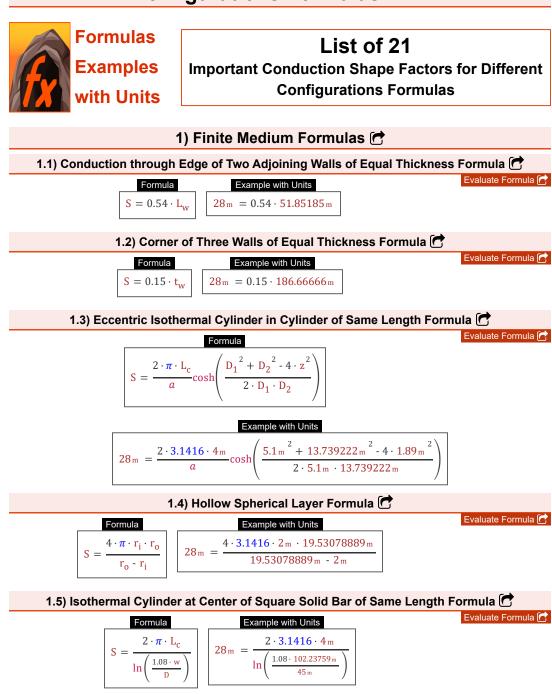
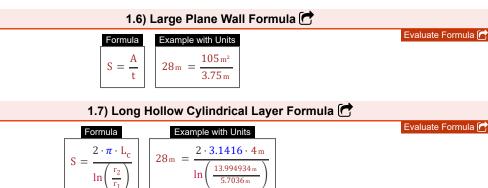
Important Conduction Shape Factors for Different Configurations Formulas PDF





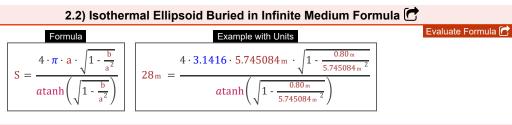


1.8) Square Flow Passag	e with Width to b Ratio Greater thar	
Formula	Example with Units	Evaluate Formula 🕝
$S = \frac{2 \cdot \pi \cdot L_{pipe}}{0.93 \cdot \ln \left(0.948 \cdot \frac{w_{o1}}{w_{l1}} \right)}$	$28_{m} = \frac{2 \cdot 3.1416 \cdot 0.10_{m}}{0.93 \cdot \ln\left(0.948 \cdot \frac{3.241843149_{m}}{3_{m}}\right)}$	
1.9) Square Flow Passa	age with Width to b Ratio Less than	1.4 Formula 🕝
Formula	Example with Units	Evaluate Formula 🕝
$S = \frac{2 \cdot \pi \cdot L_{\text{pipe}}}{0.785 \cdot \ln\left(\frac{w_{o2}}{w_{i2}}\right)}$	$28 \text{ m} = \frac{2 \cdot 3.1416 \cdot 0.10 \text{ m}}{0.785 \cdot \ln \left(\frac{6.173990514 \text{ m}}{6 \text{ m}}\right)}$	

2) In	finite	Medium	Formulas	\bigcirc
-------	--------	--------	----------	------------



Formula	Example with Units
$S = \frac{8 \cdot d_s}{\pi \cdot D}$	$28_{\rm m} = \frac{8 \cdot 494.8008429_{\rm m}}{3.1416 \cdot 45_{\rm m}}$



2.3) Isothermal Sphere Buried in Ir	nfinite Medium Formula 🕝
-------------------------------------	--------------------------

Formula	Example with Units	Evaluate Formula 🕝
$S = 4 \cdot \pi \cdot R_s$	$28m = 4 \cdot 3.1416 \cdot 2.228169m$	



Evaluate Formula

2.4) Two parallel Isothermal Cylinders placed in Infinite medium Formula 🕝

Evaluate Formula

Evaluate Formula

Evaluate Formula

Evaluate Formula (

Formula $S = \frac{2 \cdot \pi \cdot L_{c}}{a} \cosh\left(\frac{4 \cdot d^{2} - D_{1}^{2} - D_{2}^{2}}{2 \cdot D_{1} \cdot D_{2}}\right)$

Example with Units

$$28_{\rm m} = \frac{2 \cdot 3.1416 \cdot 4_{\rm m}}{a} \cosh \left(\frac{4 \cdot 10.1890145_{\rm m}^{2} - 5.1_{\rm m}^{2} - 13.739222_{\rm m}^{2}}{2 \cdot 5.1_{\rm m} \cdot 13.739222_{\rm m}} \right)$$

3) Semi Infinite Medium Formulas 🕝

3.1) Disk Buried Parallel to Suface in Semi-Infinite Medium Formula 🕝

Formula	Example with Units
$S = 4 \cdot D_d$	$28\mathrm{m}~=4\cdot7\mathrm{m}$

3.2) Isothermal Cylinder Buried in Semi-Infinite Medium Formula 🕝

FormulaExample with Units
$$S_1 = \frac{2 \cdot \pi \cdot L_c}{\ln\left(\frac{4 \cdot d_s}{D}\right)}$$
 $6.6422 \,\mathrm{m} = \frac{2 \cdot 3.1416 \cdot 4 \,\mathrm{m}}{\ln\left(\frac{4 \cdot 494.8008429 \,\mathrm{m}}{45 \,\mathrm{m}}\right)}$

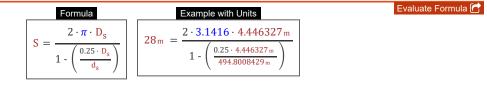
3.3) Isothermal Rectangular Parallelepiped Buried in Semi-Infinite Medium Formula 🕝 🗌

Formula
$$S = 1.685 \cdot L_{pr} \cdot \left(log10 \left(1 + \frac{D_{ss}}{W_{pr}} \right) \right)^{-0.59} \cdot \left(\frac{D_{ss}}{H} \right)^{-0.078}$$

Example with Units

$$28_{m} = 1.685 \cdot 7.0479_{m} \cdot \left(\log 10 \left(1 + \frac{8_{m}}{11_{m}}\right)\right)^{-0.59} \cdot \left(\frac{8_{m}}{9_{m}}\right)^{-0.078}$$

3.4) Isothermal Sphere Buried in Semi-Infinite Medium Formula 🕝





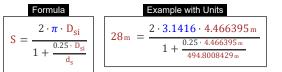
3.5) Isothermal Sphere Buried in Semi-Infinite Medium whose Surface is Insulated Formula 🕝

Evaluate Formula (

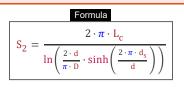
Evaluate Formula

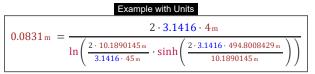
Evaluate Formula

Evaluate Formula



3.6) Row of Equally Spaced Parallel Isothermal Cylinders Buried in Semi-infinite Medium Formula

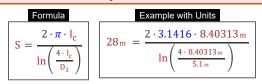




3.7) Thin Rectangular Plate Buried in Semi-Infinite Medium Formula 🕝

Formula	Example with Units
$S = \frac{2 \cdot \pi \cdot W_{\text{plate}}}{\ln\left(\frac{4 \cdot W_{\text{plate}}}{L_{\text{plate}}}\right)}$	$28m = \frac{2 \cdot 3.1416 \cdot 35.42548m}{\ln\left(\frac{4 \cdot 35.42548m}{0.05m}\right)}$

3.8) Vertical Isothermal Cylinder Buried in Semi-Infinite Medium Formula 🕝



Variables used in list of Conduction Shape Factors for Different Configurations Formulas above

- a Semi Major Axis of Ellipse (Meter)
- A Cross-Sectional Area (Square Meter)
- **b** Semi Minor Axis of Ellipse (Meter)
- d Distance Between Centers (Meter)
- D Diameter of Cylinder (Meter)
- D1 Diameter of Cylinder 1 (Meter)
- D₂ Diameter of Cylinder 2 (Meter)
- D_d Diameter of Disk (Meter)
- d_s Distance from Surface to Centre of Object (Meter)
- D_s Diameter of Sphere (Meter)
- D_{si} Diameter of Sphere Insulated (Meter)
- D_{ss} Distance from Surface to Surface of Object (Meter)
- H Height of Parallelepiped (Meter)
- Ic Length of Cylinder 1 (Meter)
- L_c Length of Cylinder (Meter)
- Lpipe Length of Pipe (Meter)
- Lplate Length of Plate (Meter)
- Lpr Length of Parallelepiped (Meter)
- L_w Length of Wall (Meter)
- **r**₁ Inner Radius of Cylinder (Meter)
- **r**₂ Outer Radius of Cylinder (Meter)
- ri Inner Radius (Meter)
- ro Outer Radius (Meter)
- Rs Radius of Sphere (Meter)
- S Conduction Shape Factor (Meter)
- S1 Conduction Shape Factor 1 (Meter)
- S₂ Conduction Shape Factor 2 (Meter)
- t Thickness (Meter)
- tw Thickness of Wall (Meter)

Constants, Functions, Measurements used in list of Conduction Shape Factors for Different Configurations Formulas above

- constant(s): pi,
 3.14159265358979323846264338327950288
 Archimedes' constant
- Functions: acosh, acosh(Number) Hyperbolic cosine function, is a function that takes a real number as an input and returns the angle whose hyperbolic cosine is that number.
- Functions: atanh, atanh(Number) The inverse hyperbolic tangent function returns the value whose hyperbolic tangent is a number.
- Functions: cosh, cosh(Number) The hyperbolic cosine function is a mathematical function that is defined as the ratio of the sum of the exponential functions of x and negative x to 2.
- Functions: In, In(Number) The natural logarithm, also known as the logarithm to the base e, is the inverse function of the natural exponential function.
- Functions: log10, log10(Number) The common logarithm, also known as the base-10 logarithm or the decimal logarithm, is a mathematical function that is the inverse of the exponential function.
- Functions: sinh, sinh(Number) The hyperbolic sine function, also known as the sinh function, is a mathematical function that is defined as the hyperbolic analogue of the sine function.
- Functions: sqrt, sqrt(Number) A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- Functions: tanh, tanh(Number) The hyperbolic tangent function (tanh) is a function that is defined as the ratio of the hyperbolic sine function (sinh) to the hyperbolic cosine function (cosh).
- Measurement: Length in Meter (m) Length Unit Conversion

- W Width of Square Bar (Meter)
- Wi1 Inner Width 1 (Meter) •
- Wi2 Inner Width 2 (Meter)
- Wo1 Outer Width 1 (Meter)
- Wo2 Outer Width 2 (Meter)
- Wplate Width of Plate (Meter)
- Wpr Width of Parallelepiped (Meter)
- Z Eccentric Distance Between Objects (Meter)

• Measurement: Area in Square Meter (m²) Area Unit Conversion 🕝



- Important Conduction in Cylinder Formulas Important
- Important Conduction in Plane Wall
 Formulas
- Important Conduction in Sphere Formulas (C)
- Important Conduction Shape Factors
 for Different Configurations

Formulas 🕝

- Important Other shapes Formulas
- Important Steady State Heat Conduction with Heat Generation Formulas
- Important Transient Heat Conduction
 Formulas

Try our Unique Visual Calculators

- 🔀 Percentage change 🕝
- 🎆 LCM of two numbers 🕝

Image: Second Second

Please SHARE this PDF with someone who needs it!

This PDF can be downloaded in these languages

English Spanish French German Russian Italian Portuguese Polish Dutch

9/23/2024 | 11:42:18 AM UTC

