

AguaClara : AutoCAD Lamina Program

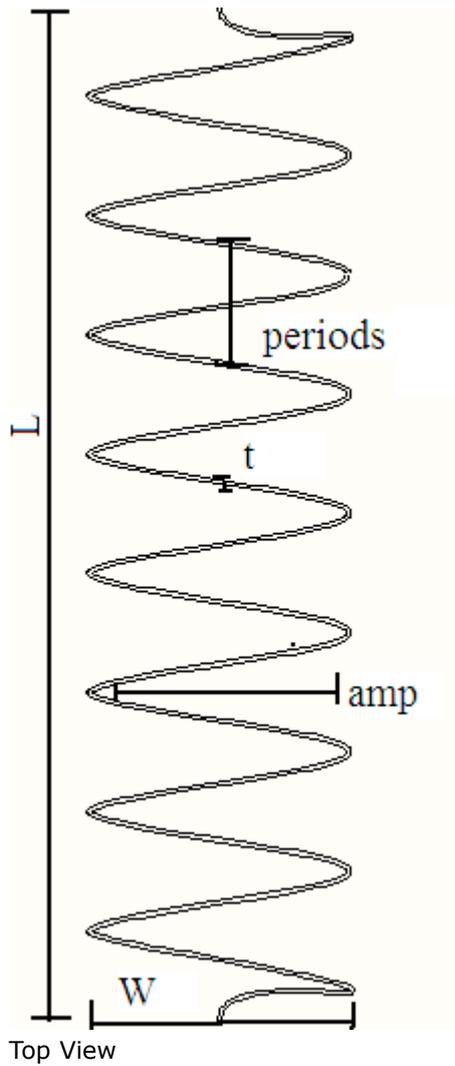
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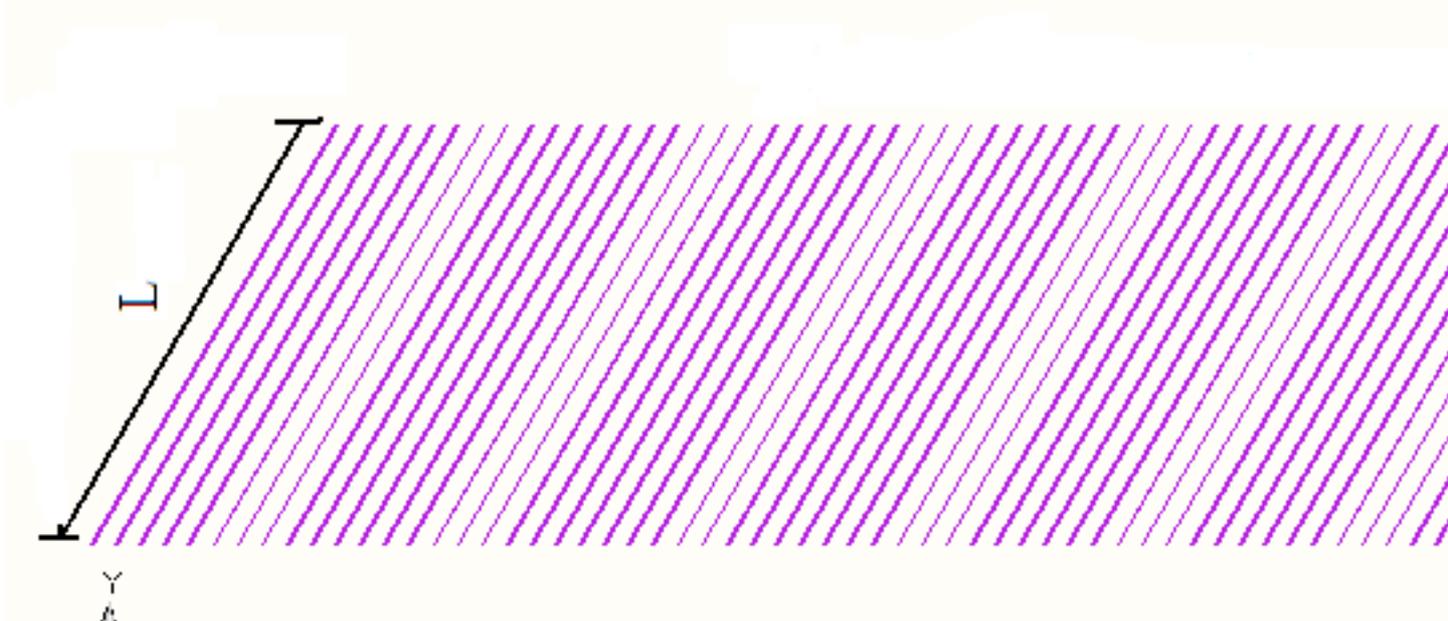
General Program Information

Input Definitions

Inputs Needed to Call the Channel Function

Inputs Defined within the Channel Function





Front View

origin - is a 3*1 matrix with x,y,z positions corresponding to the point where the first lamella will be drawn.

amp - specifies the amplitude of the lamina

w - specifies the width of an individual lamina

l - specifies the length of an individual lamina

t - specifies the thickness of an individual lamina

periods - specifies the period of one curve of the lamina.

angle - specifies the angle of the lamina relative to the floor of the tank.

num_{baffles} - specifies the number baffles in the tank

num_{bafflescol} -

xspace -

yspace -

Technical Program Outline

lamina₀ - The [zoom_{winA}](#) function creates a close-up view based on two points to specify the window size.

p1:

- x: origin₀ - w - zc
- y: origin₁
- z: origin₂

p2:

- x: origin₀ + w + zc
- y: origin₁ + 1 + zc
- z: origin₂

for loop - a for loop is created for the range from $i = 0$ to $i = (\text{periods} * 4)$.

lamina_{last} - Every time the program runs through the for loop another sine wave is drawn.

lamina_{last}:

- x: origin₀ + sin(#i/2)*amp
- y: origin₁ + i*(x/(periods*4))
- z: origin₂

lamina_{i+1} - Uses the 'point' function to turn the 3*1 matrix lamina_{last} into a text format that AutoCad can read.

lamina_{i+2} - Uses the 'concat' function create a character string out of a space and the point (origin - zC_{point}).

lamina_{i+3} - Uses the 'point' function to turn the 3*1 matrix (lamina_{last} + zC_{point}) into a text format that AutoCad can read.

lamina_{i+4} - Enters the command "offset" into AutoCad. The offset function is used to move the selected object a specified distance from its original location.

lamina_{i+5} - The command 'stringit' turns the the variable "t" into a dimensionless number and cuts the number off after 5 decimal points. t represents the distance that the selected object is to be offset.

lamina_{i+6} - Uses the 'point' function to turn the 3*1 matrix 'origin' into a text format that AutoCad can read.

lamina_{i+7} - Uses the 'point' function to turn the following 3*1 matrix into a text format that AutoCad can read.

- x: origin₀ + t
- y: origin₁
- z: origin₂

line₀ - Uses the 'concat' function to create a character string out of the point 'origin' a space and the point converted in line lamina_{i+7}.

line₁ - Uses the 'concat' function to creat a character string out of the point 'lamina_{last}' a space and the point described below into Autocad.

- x: lamina_{last0} + t
- y: lamina_{last1}
- z: lamina_{last2}

lamina_{i+8} - Uses the 'concat' function to create a character string out of a space, the AutoCad command "line," a space, the character string created in line₀, and a space. The purpose of the character string is to create a line in AutoCad between the two points specified in line₀.

lamina_{i+9} - Uses the 'concat' function to create a character string out of a the AutoCad command "line," a space, the character string created in line₁ and a space. The purpose of the character string is to create a line in AutoCad between the two points specified in line₁.

lamina_{i+10} - Uses the 'concat' function to create a character string out of the AutoCad command "z e region w," a space, a point described below, a space, the second point described below and a space. The purpose of the character string is to create a region based on the two points specified.

first point:

- x: origin₀ - amp
- y: origin₁
- z: origin₂

second point:

- x: lamina_{last0} + t + amp
- y: lamina_{last1}

- z: lamina_{last2}

z: zoom

e: extents

region: creates a region based on two specified points.

w: specifies corners for the window in which the region is to be created.

lamina_{i+11} - Uses the concat function to create a character string out of the AutoCad command [extrude](#), a space, the point 'origin,' a space, a space, the variable 'l,' a space and the "0."

lamina_{i+12} - Uses the concat function to create a character string out of the AutoCad command [rotate3d](#), a space, the point 'origin,' a space, a space, the command "y," a space and a num2str (-(90-angle/deg)) if the angle is not 90 degrees.

lamina_{i+13} - Uses the concat function to create a character string out of the AutoCad command [array](#), a space, the point 'origin,' a space, a space, the command "R," a space, num2str(num_{bafflecols}, a space,num2str_{baffles} and a space.

lamina_{i+14} - Together lamina_{i+14} and lamina_{i+15} for an if statement. Lamina_{i+14} uses the concat function to create a character string that enters the dimensionless number "yspace" if num_{bafflecols} is less than 1.

lamina_{i+15} - Enters "" into the command line if the condition in lamina_{i+14} is not fulfilled.