



MAGNETISiM

Defining Winding: Round

GUI Overview

TAB MENU

Core Geometry Tab (Ctrl+1)

Winding Geometry Tab (Ctrl+2)

Sim Config Tab (Ctrl+3)

Magnet Tab (Ctrl+4)

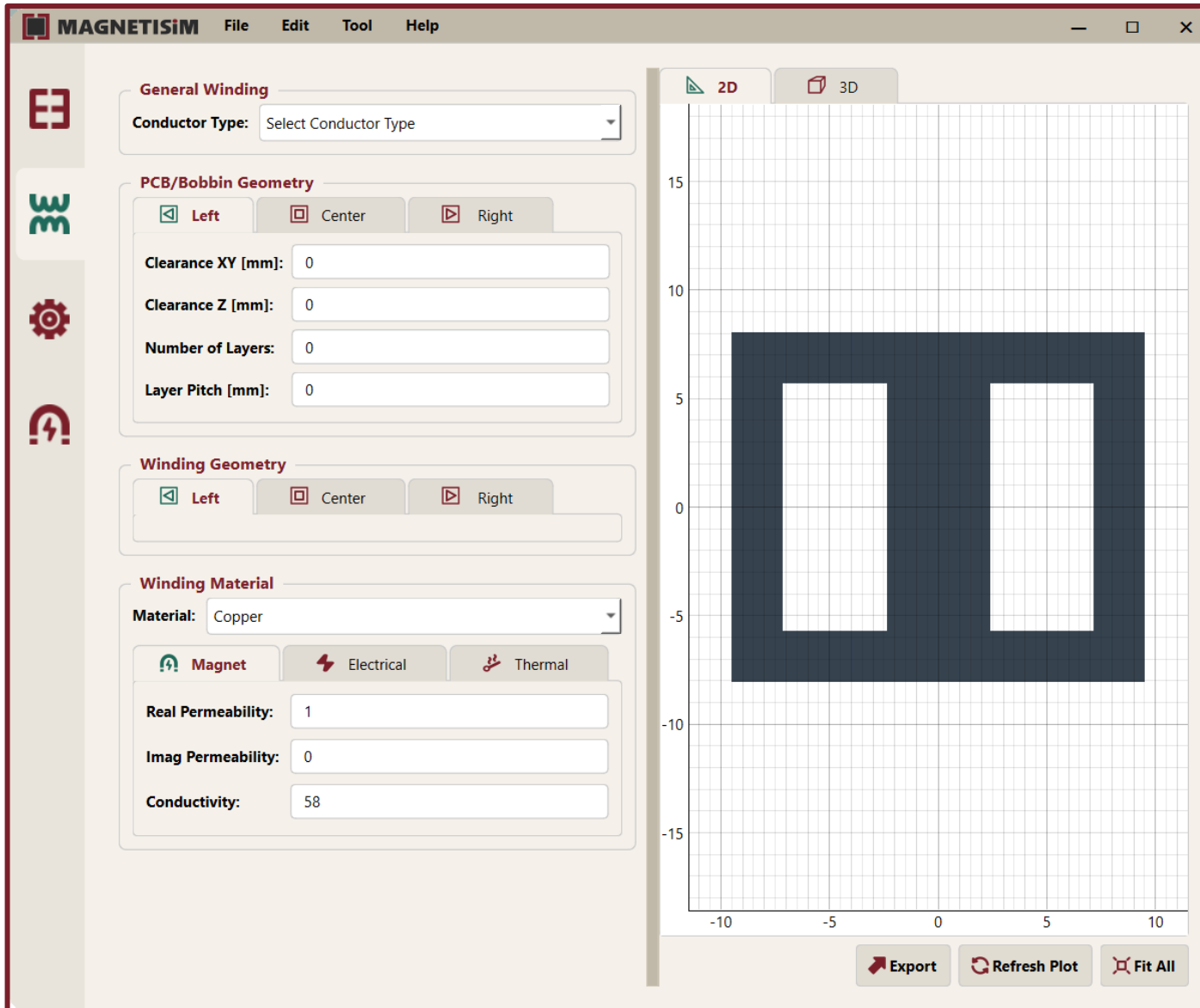
INPUT FRAME

The screenshot displays the MAGNETISiM software interface. At the top, a menu bar includes 'File', 'Edit', 'Tool', and 'Help'. On the left, a vertical 'TAB MENU' contains four icons: a core symbol (Ctrl+1), a winding symbol (Ctrl+2), a gear (Ctrl+3), and a magnet symbol (Ctrl+4). The main area is divided into two input frames. The 'Core Geometry' frame includes dropdown menus for 'Manufacturer', 'Geometry Core', and 'Core Reference', followed by input fields for dimensions A [mm] through I [mm] and 'Gap [mm]', all currently set to 0. The 'Core Material' frame includes a 'Material' dropdown, tabs for 'Magnet', 'Power Loss', 'Electrical', and 'Thermal', and input fields for 'Real Permeability', 'Imag Permeability', and 'Conductivity', all set to 0. A button 'Add Permeability(f) Curve' and a checkbox 'Permeability(f) from Internal-Database' are also present. On the right, the 'MODELER WINDOW' shows a 2D plot with axes ranging from -0.6 to 0.6. At the bottom of the plot are buttons for 'Export', 'Refresh Plot', and 'Fit All'. A 'BAR TOOL' is indicated at the top right of the window.

BAR TOOL

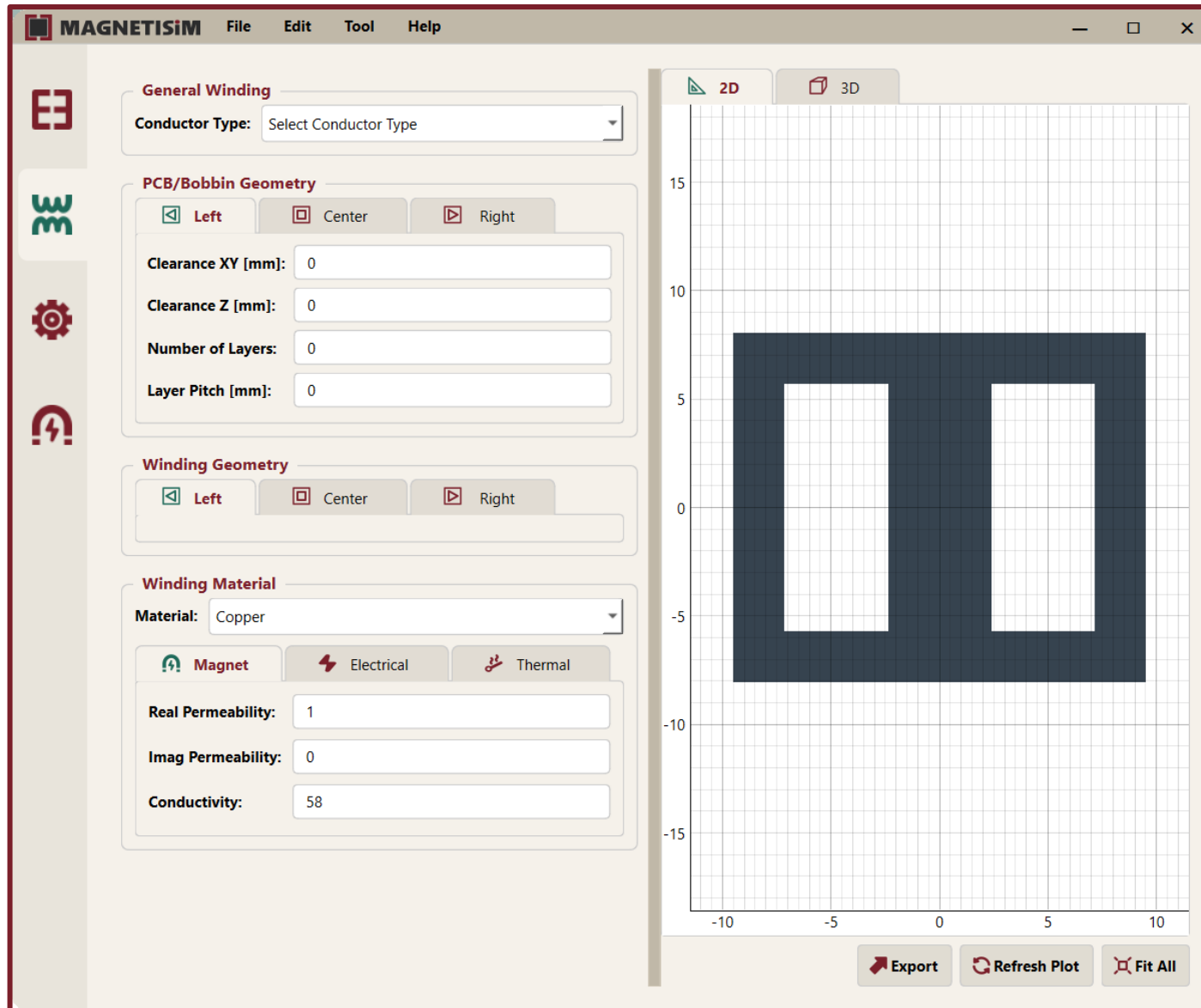
MODELER WINDOW

Winding Geometry Selection – PCB



Before configuring the winding details, make sure your core geometry is properly selected and visualized in the modeler window.

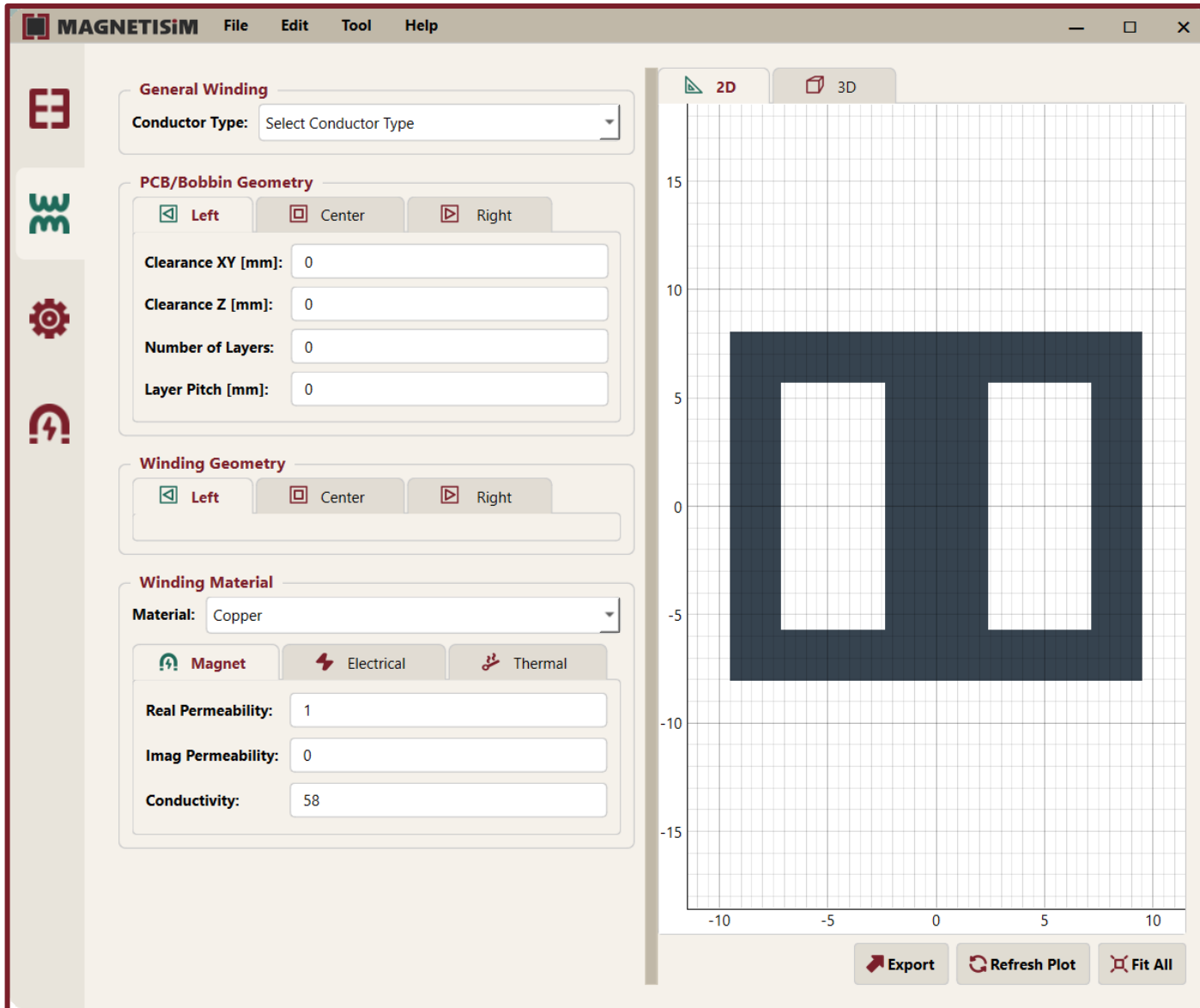
PCB/Bobbin Geometry



Once in the **Winding Geometry tab**, the first step is to configure the overall boundaries of your board in the **PCB/Bobbin Geometry section**.

- **Clearance XY** - This sets the horizontal safety margin or distance between the PCB traces and the core walls.
- **Clearance Z** - This defines the vertical safety distance.
- **Number of Layers** - Here you specify the total number of conductive copper layers your PCB design will have.
- **Layer Pitch** - This dictates the vertical separation between each of those PCB layers.

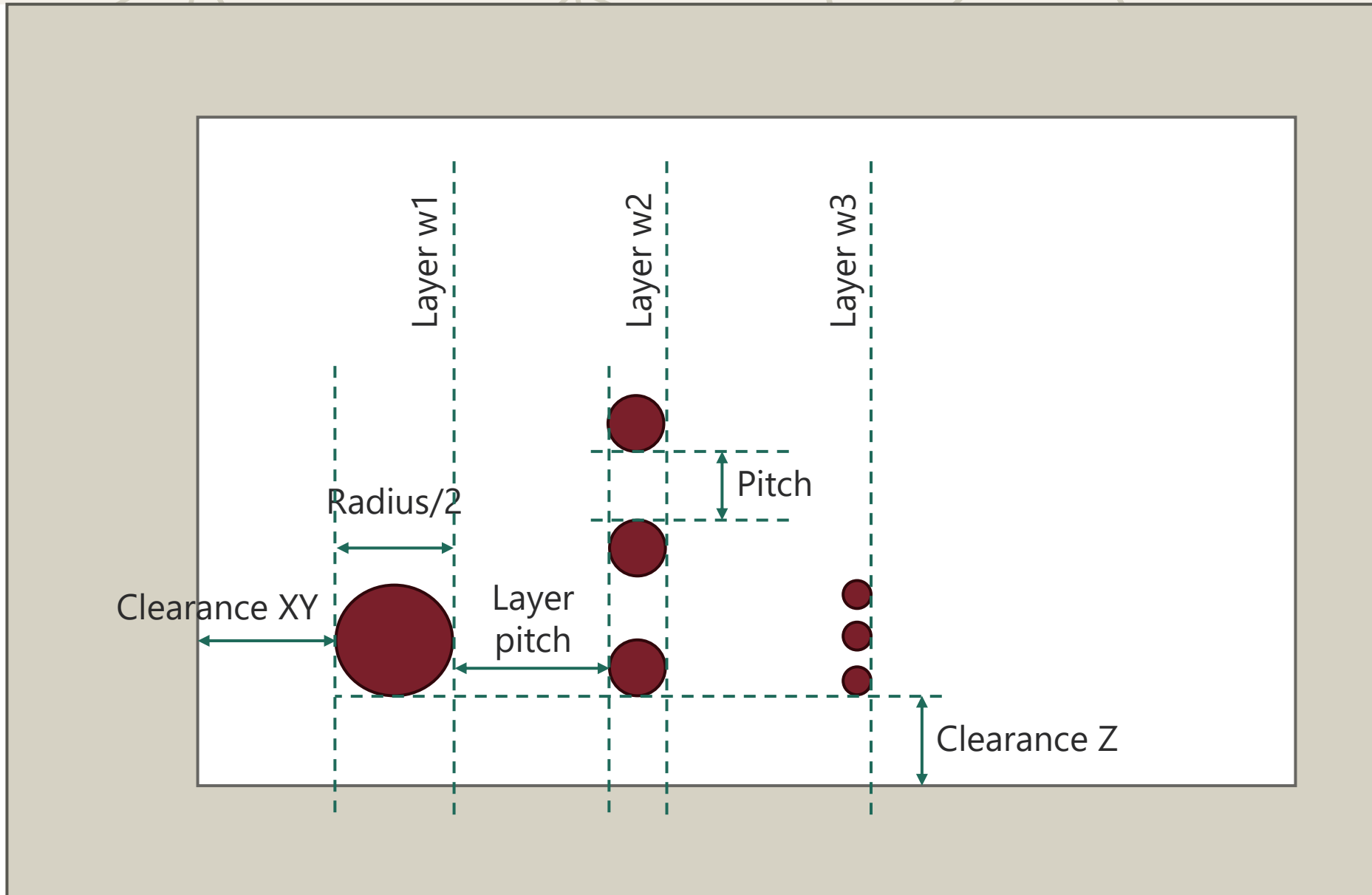
Winding Geometry



After defining the board structure, move to the **Winding Geometry section** to specify the physical dimensions of the tracks.

- **Distribution** - Distribution of the turns (Vertical or Horizontal).
- **Nturns** - The number of turns per layers.
- **Copper Radius** - The horizontal width of the copper trace.
- **Pitch** - The spacing between adjacent turns on the exact same layer.

Round Distribution parameters



Example

The image displays the MAGNETISiM software interface for configuring a winding geometry. It is divided into three main sections on the left and a 2D grid view on the right.

PCB/Bobbin Geometry

- Alignment: Center
- Clearance XY [mm]: 1
- Clearance Z [mm]: 1
- Number of Layers: 3
- Layer Pitch [mm]: 0.3

Winding Geometry

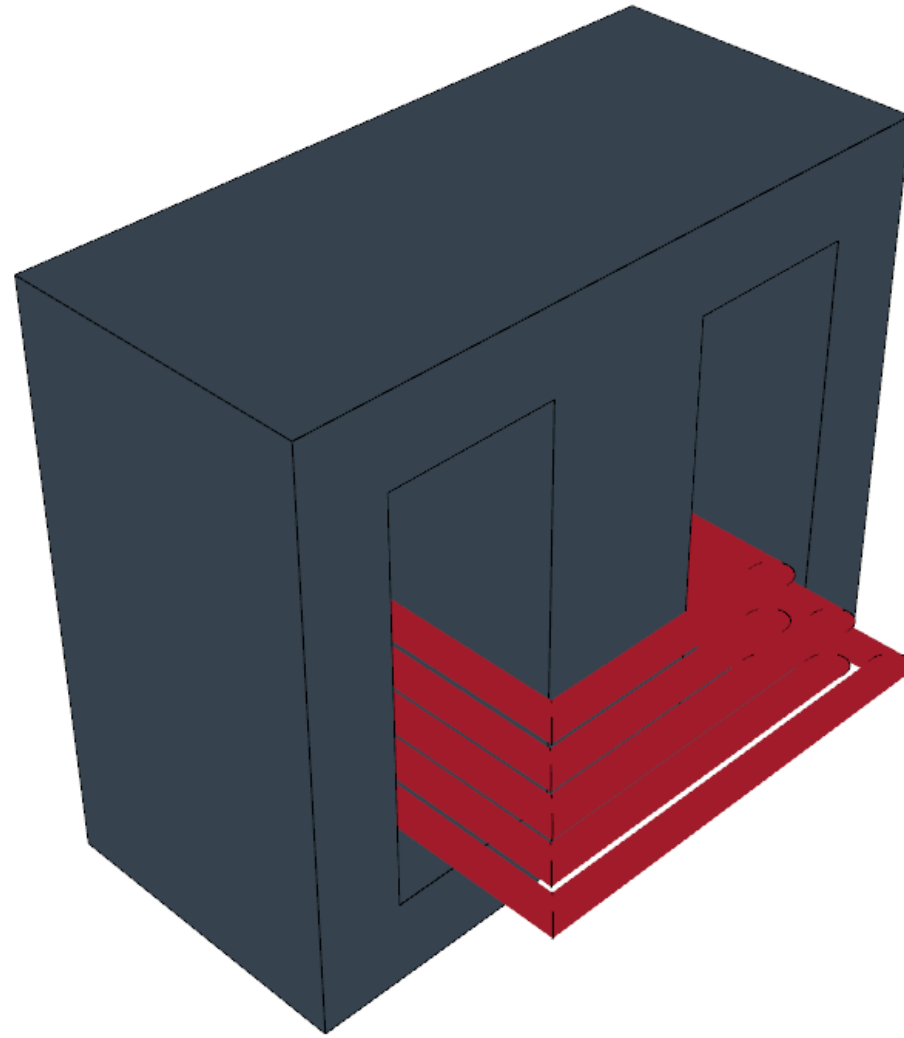
- Alignment: Center
- Distribution: V
- Nturns: 3,2,1
- Copper Radius [mm]: 0.4
- Pitch [mm]: 0.6

Winding Material

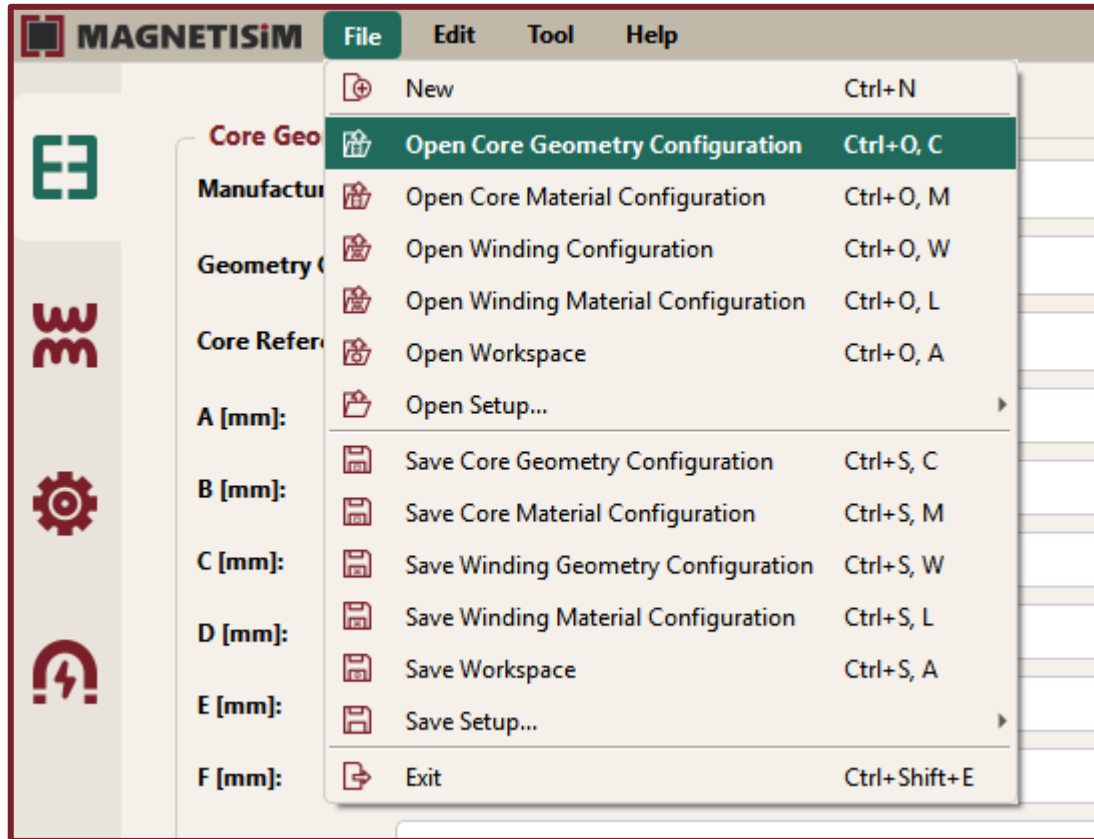
- Material: Copper

The 2D grid view on the right shows three winding windows, labeled W1, W2, and W3, arranged in a staggered pattern. The vertical axis is labeled from -1 to -5. W1 is at approximately (-1.5, -1.5), W2 is at approximately (-2.5, -3.0), and W3 is at approximately (-4.0, -4.5).

3D View of the example



Winding: Round – .json



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{  
  "ConductorType": "Round",  
  "ClearanceXY_Left": 1.0,  
  "ClearanceXY_Center": 0.0,  
  "ClearanceXY_Right": 1.0,  
  "ClearanceZ_Left": 2.0,  
  "ClearanceZ_Center": 10.0,  
  "ClearanceZ_Right": 1.0,  
  "Nlayers_Left": 3,  
  "Nlayers_Center": 3,  
  "Nlayers_Right": 1,  
  "LayerPitch_Left": [  
    # per layers,  
  ],  
  "LayerPitch_Center": [  
    # per layers,  
  ],  
  "LayerPitch_Right": [  
    # per layers,  
  ],  
  "Distribution_Left": "V",  
  "Distribution_Center": "V",  
  "Distribution_Right": "V",  
  "Nturns_Left": [  
    # per layers,  
  ],  
  "Nturns_Center": [  
    # per layers,  
  ],  
  "Nturns_Right": [  
    # per layers,  
  ],  
  ..... Continue→  
}
```

```
"CopperRadius_Left": [  
  # per layers,  
],  
"CopperRadius_Center": [  
  # per layers,  
],  
"CopperRadius_Right": [  
  # per layers,  
],  
"Pitch_Left": [  
  # per layers,  
],  
"Pitch_Center": [  
  # per layers,  
],  
"Pitch_Right": [  
  # per layers,  
],  
"Edge_Left": [  
  # per layers,  
],  
"Edge_Center": [  
  # per layers,  
],  
"Edge_Right": [  
  # per layers,  
]  
}
```



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