

# ANSYS AIM Eddy Current / Magnetic Frequency Response - Physics Setup

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[Problem Specification](#)

[1. Pre-Analysis & Start-Up](#)

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## Physics Setup

Click on **Physics** in the workflow. In the **Physics** template input a **Frequency** of 200Hz.

**Physics**

Attention required

▼ Settings

Calculation type  
Frequency response

Frequency specification  
Single value

Frequency  
200 Hz

▼ Physics Definition

Physics Regions (1) Add ▼

Material Assignments Add ▼

> Physics Options (3) Add ▼

> Electromagnetic Conditions Add ▼

> Interface Conditions Add ▼

▼ Physics Solution

> Solver Options (3) ⚠ Add ▼

> Monitors (2) Add ▼

> Auxiliary Definitions


> Output Solve Physics

! 1 object requires attention


> Related Objects

## Specify Material

Click on **Add**, next to **Material Assignments > Material Assignment > Air (Material Samples)**. Next, click on body selection in top right corner. Select the **Surrounding region** and click **Add**. This assigns air to the surrounding region.



## Air Assignment 1


Up-to-date

Location ?

1 volume

+
-

Material

Air

Material state

Gas

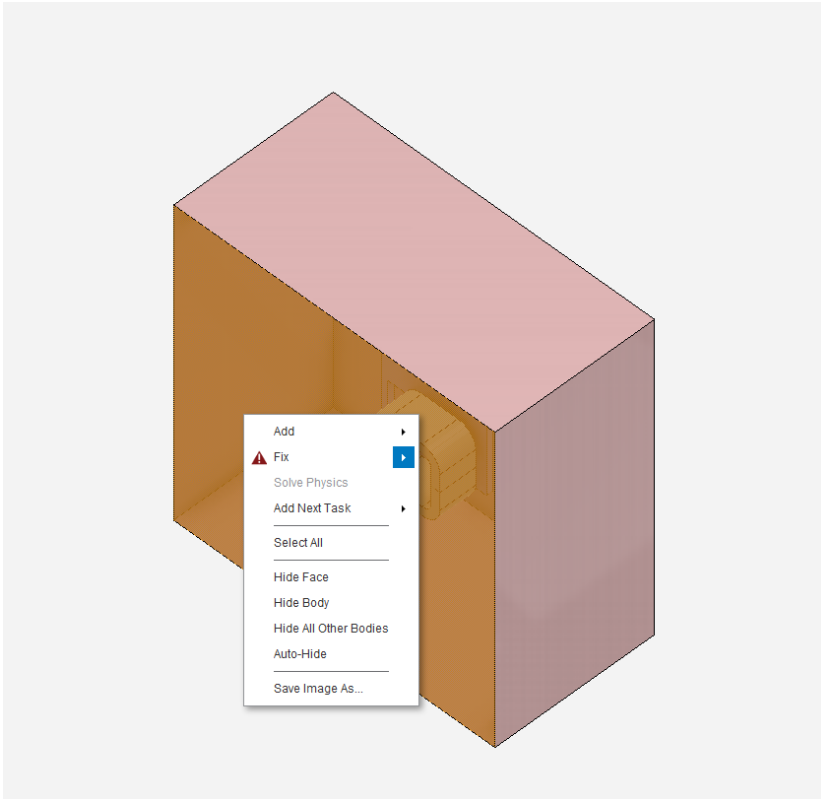
>Air

(used by 1 object)

Next Step

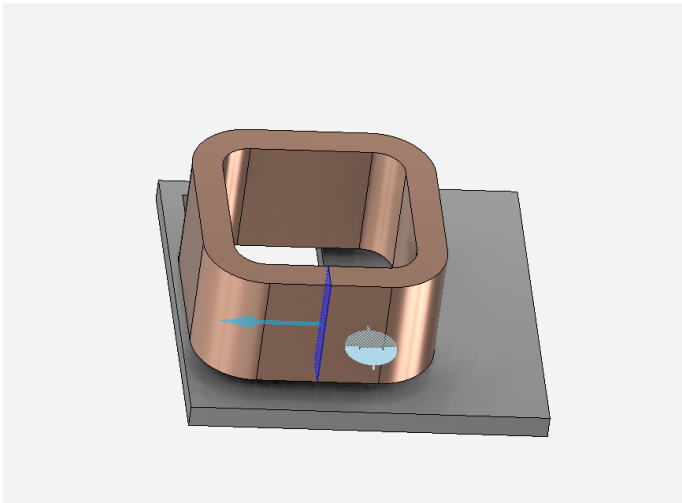
> Related Objects and Tasks

Repeat the above steps except assign **Copper (Material Sample)** to the coil and **Aluminum Alloy (Material Sample)** to the plate. In order to make this process easier. Right click on surrounding region and select **Hide Body**.



## Boundary Conditions / Forces

Since a current is running through the copper coil, a current condition will need to be created. Right click > **Add > Electromagnetic Conditions > Current**. Then select the face below for the **Cross-Sectional face or body**.



Input an **Operating Current** of 2.742 Amps and 1000 for **Number of Conductors**.

I

Current 1

Up-to-date

Define path by

☒ Cross-section

☐ Source and return

☐ Multiple terminals

Cross-sectional face or body

1 volume

+

↔

Operating current

2.742 A

▶

Phase

0 radian

▶

Number of conductors

1000

▶

☐ Reverse polarity

☐ Connected in parallel

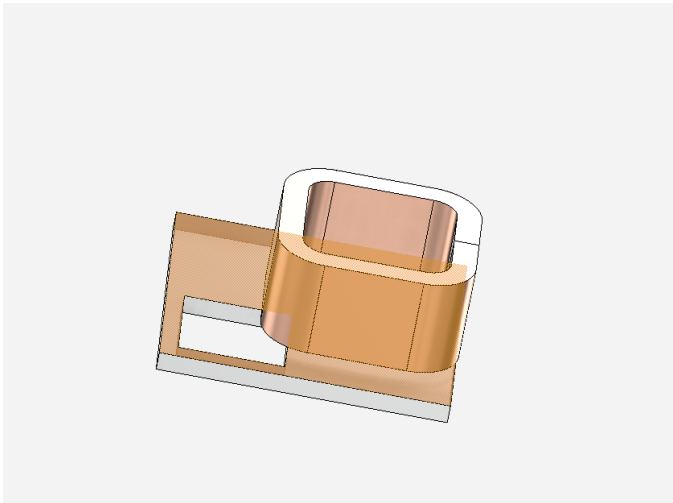
☐ Show conduction path

Generate Conduction Paths

Next Step ▶

> Related Objects and Tasks

Finally, a **Skin Depth Resolution** needs to be specified. Right click, and select **Fix**. Select the top face of the plate and move the **Resolution** slider up to **Fine**. The **Skin Depth Resolution** will automatically refine the mesh where the eddy currents occur.



## Skin Depth Resolution 1

Up-to-date

Surface location

Resolution ?  
 Coarse Fine

> Related Objects and Tasks

**Go to Step 4: Numerical Solution/Results**

[Go to all ANSYS AIM Learning Modules](#)