

ANSYS AIM Permanent Magnetic Circuit with Air Gap - Physics Setup

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[Problem Specification](#)

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

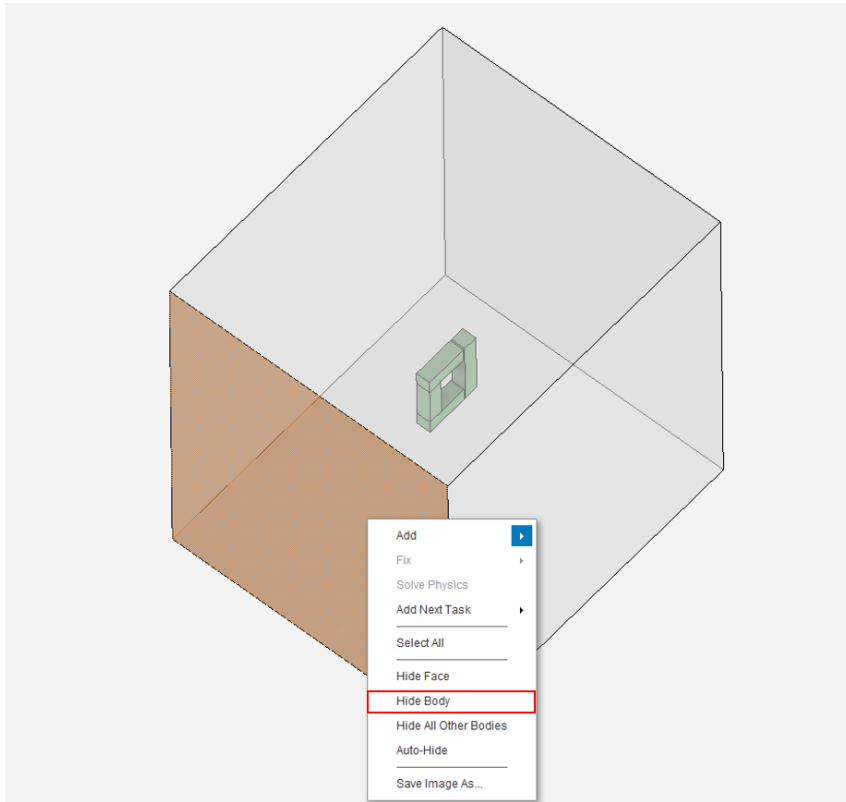
[2. Geometry](#)

[3. Physics Setup](#)

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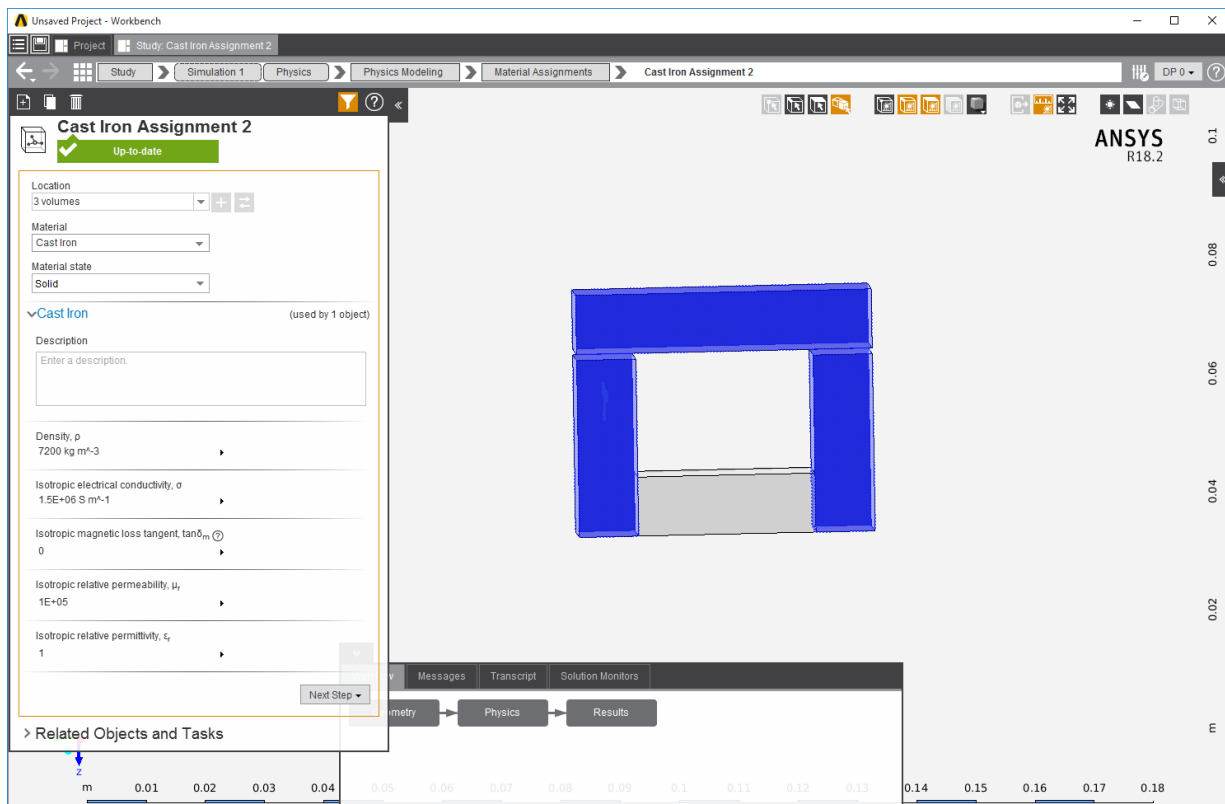
Physics Setup

In the **Workflow**, press the **Physics** button. Right click on the enclosure and select **Hide Body**.



Specify Material

Next to **Material Assignments**, press the **Add** drop down menu **Material Assignment** > Search for **Cast Iron (Material Samples)** and select it. Make sure you change the **Isotropic relative permeability** to $1(10)^5$. Next, click on the **Body Selection** tool in top right corner and select the three beams and click **Add**.



Next, a magnetic material will be created. Instead of searching for cast iron, search "Mag" and click on **Create Mag**. Set the **Default State** to **Solid**. To create a material property, select **Add** and choose the following material properties. Input 625000 S m^{-1} for **Isotropic Electrical Conductivity**. Input 5.305 for **Isotropic Relative Permeability**. Input 150000 A m^{-1} for the **Magnetic Coercivity**. (You can use "Type to Search" to find the **Magnetic Coercivity** property.) Select **Cartesian magnetization direction**, then input $3/2$ for the **X direction** (you can enter the expression $\sqrt{3}/2$ to define the x direction) and $1/2$ for the **Y direction**.



mag



Up-to-date

Description ?

Enter a description.

Default state

Solid

▼ Solid Properties

Add ▼

Isotropic electrical conductivity, σ

6.25E+05 S m⁻¹

Isotropic relative permeability, μ_r

5.305

▼ Magnetic Coercivity



Magnitude

1.5E+05 A m⁻¹

Magnetization direction

Cartesian

X

$f = 0.86603$

Y

0.5

Z

0

Liquid Properties

Add ▼

Gas Properties

Add ▼

► Related Objects and Tasks

[Go to Step 5: Numerical Solution/Results](#)

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