



Electromagnetics:
Electromagnetic Field Theory

Classes of Electric Materials

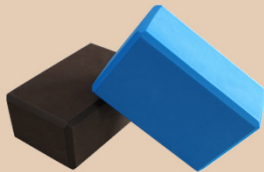


1

Classification by Conductivity

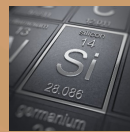
Insulator

$$\sigma \ll 1$$



- No free charges
- Opposes current
- Most dielectrics are insulating

Semiconductor



- Often switchable and tunable conductivity
- Silicon, gallium arsenide, etc.

Conductor

$$\sigma \gg 1$$



- Many free charges
- Easily conducts current
- Most metals are conducting

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