



Coil Winding for Wind Generators

By Keith W. Klontz, PhD, PE

ADVANCED MOTORTECH LLC

- **Introduction & Overview**
- **Coils in Generators, Features & Functions**
- **Round-wire Coils**
- **Rectangular Wire Coils**
- **Design Choices & Trade-offs**
- **Thermal Issues and Management Solutions**
- **Manufacturing Choices & Trade-offs**

Coil/Core Components

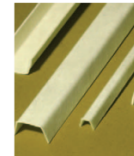
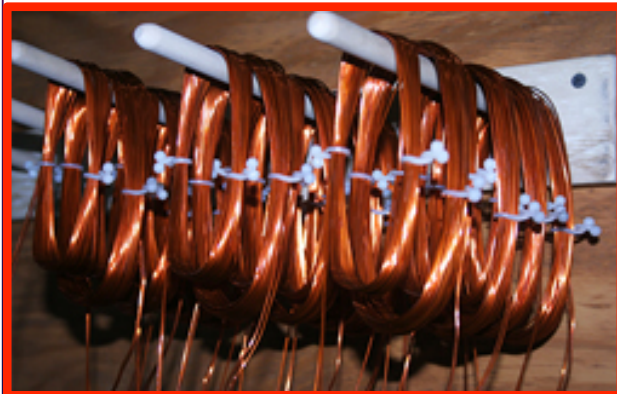
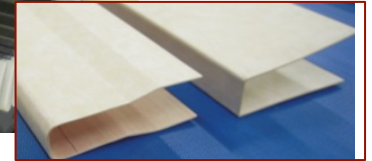
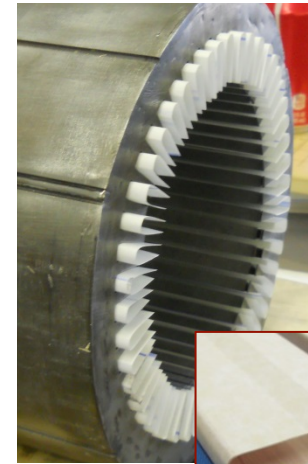


Lamination



Lamination Stack, Core

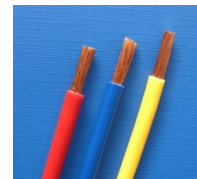
Insulated core



Stator sub-assembly

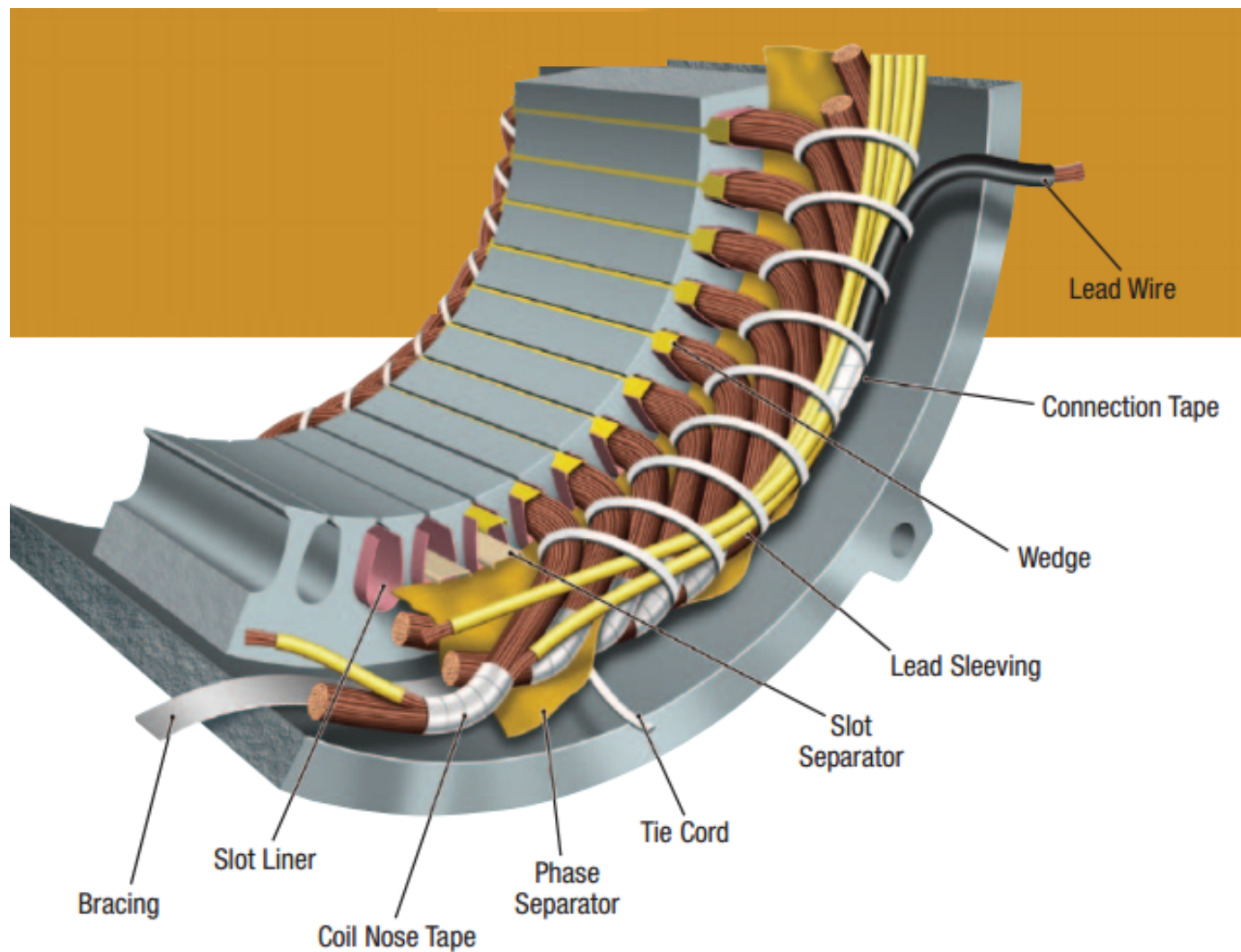


Coils, sleeving, insertion

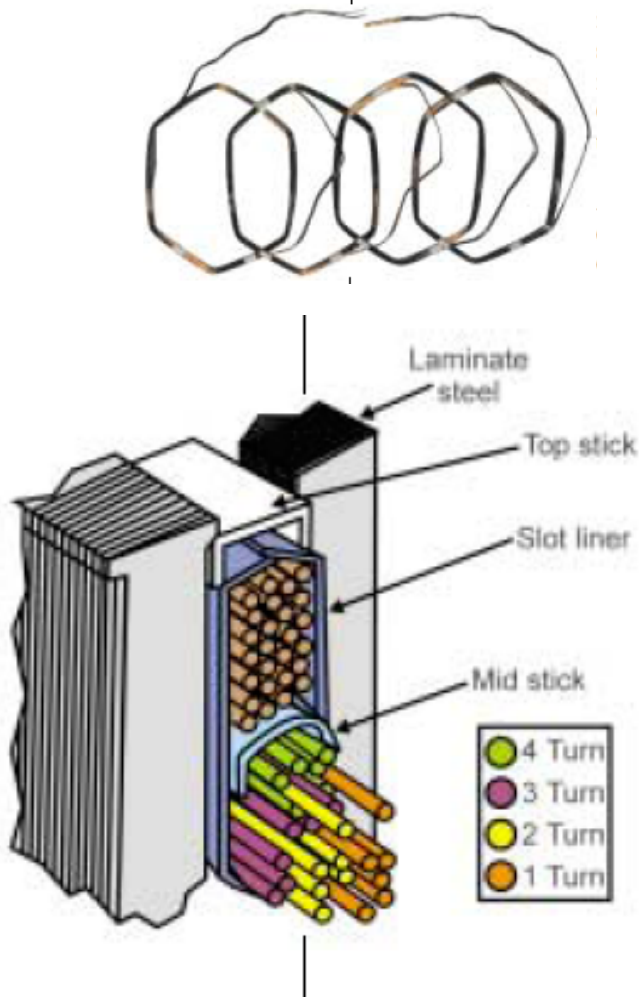


Wedges, tie-cord, lead wire

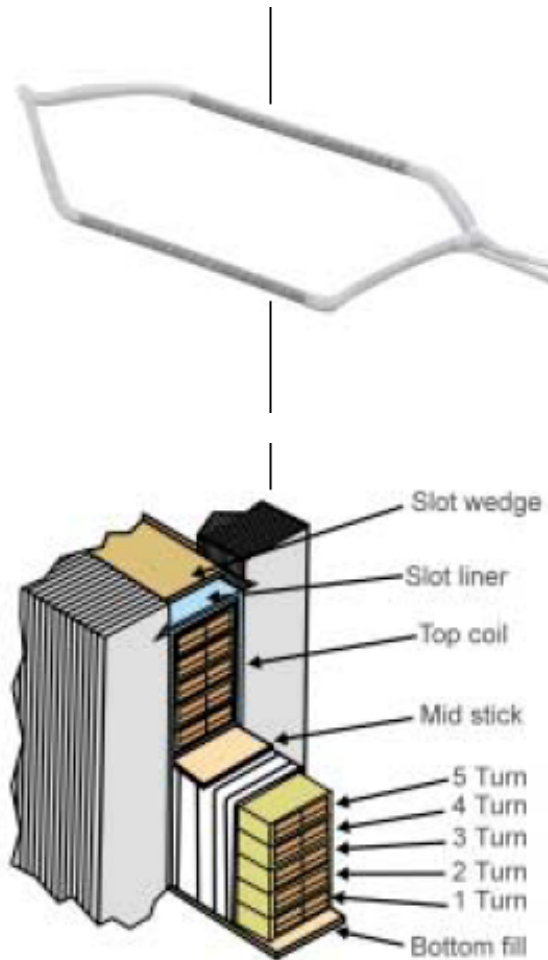
Stator Components--Summary



Round Wire-Random Wound Coils



Rectangular Wire-Form Wound Coils



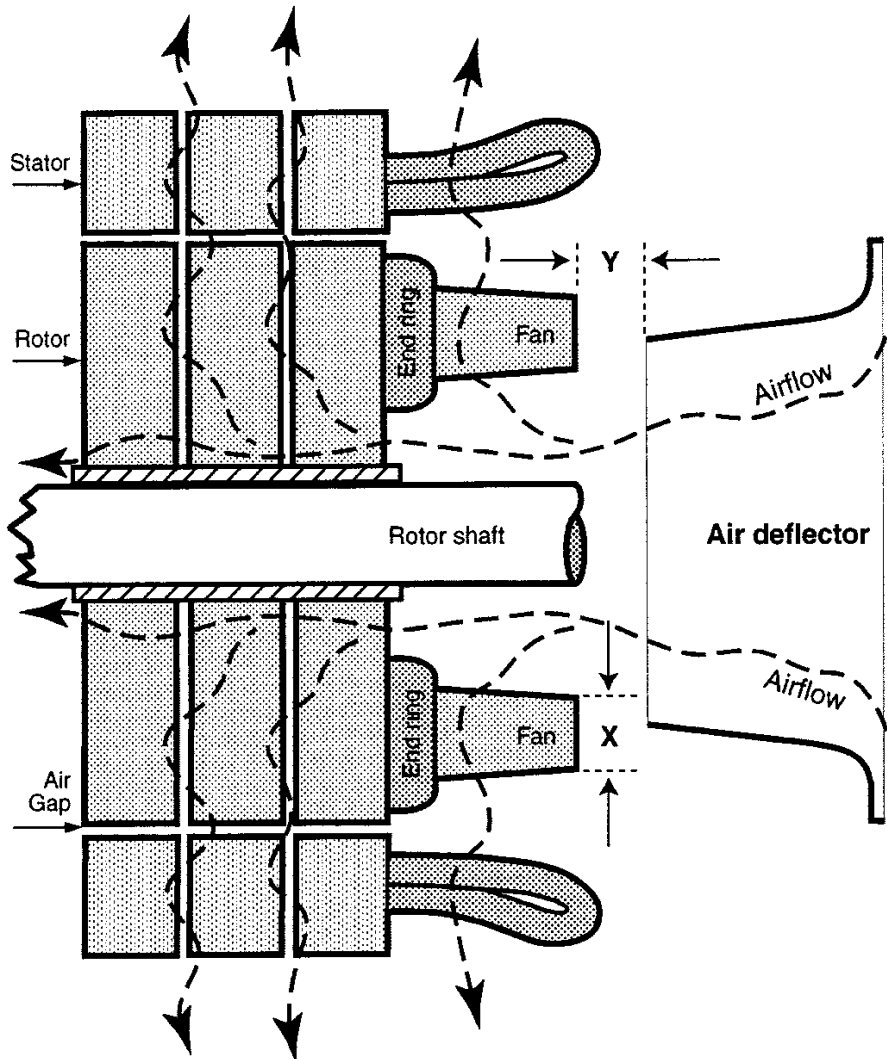
Design Choices— Coils, Phases, Circuits, Slots, Poles

Affects Performance:
Losses & Heat
Frequency
Reactance (Volt Drop)

Affects Costs:
Manufacturing
Materials
Weight

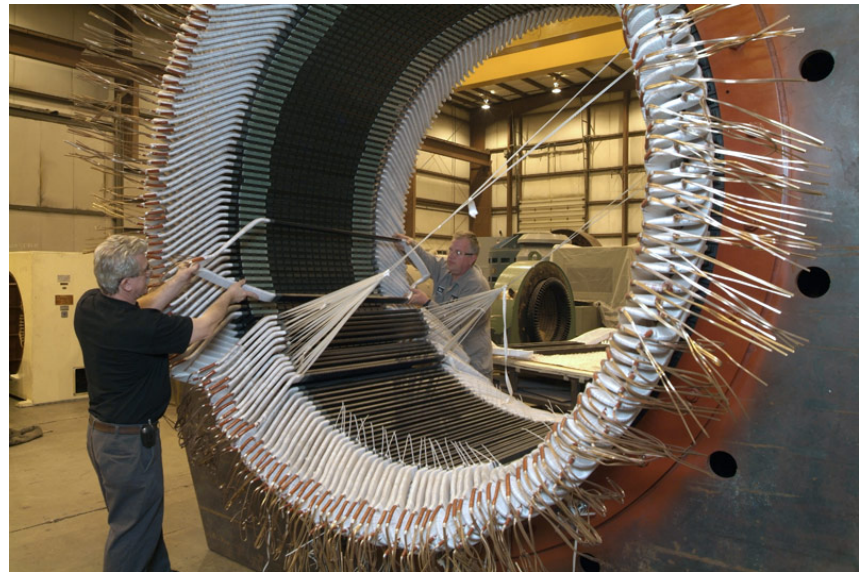
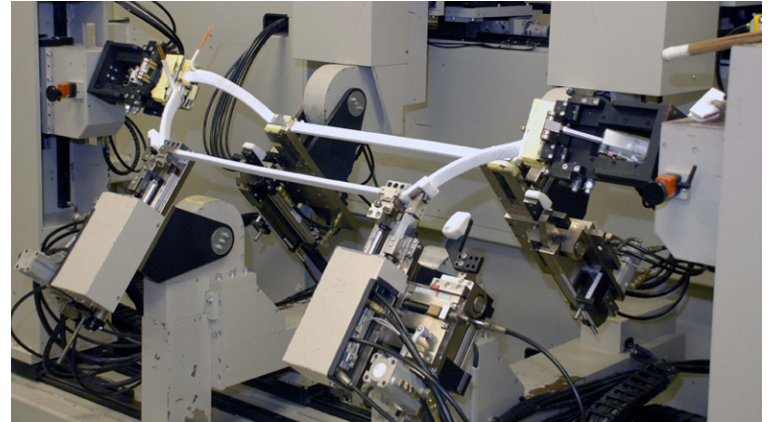
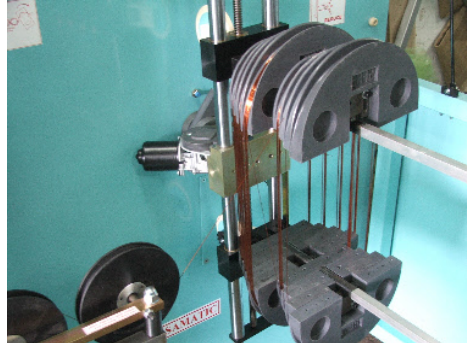
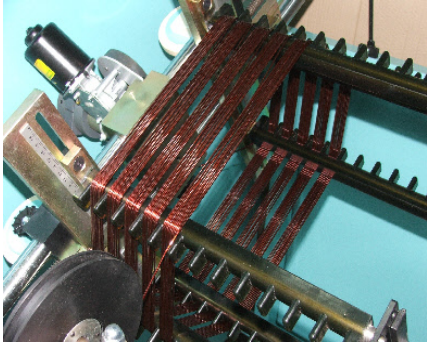


Thermal Concerns



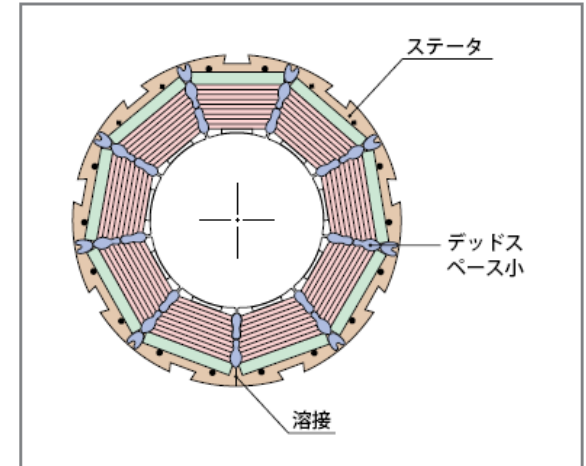
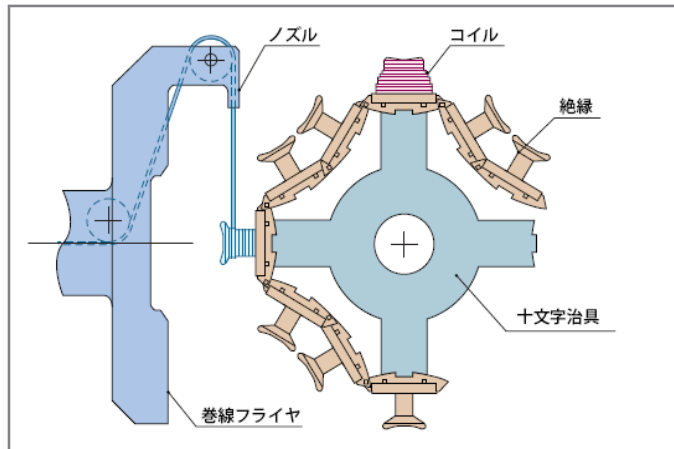
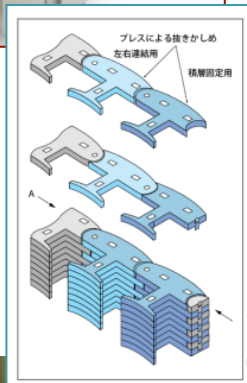
- Coils #1 Source of Heat
- Also lamination heat
- Heat Transfer—Hot→Cold

Manufacturing

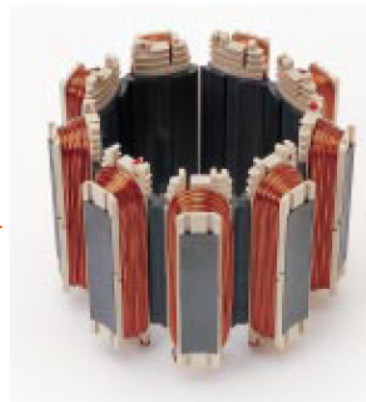
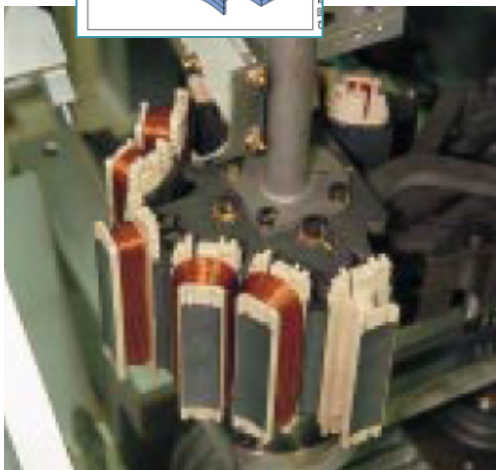


Manufacturing

Segmented & Hinged Laminations



【図4】 コイルを巻いて、再び裏返しにして元に戻す。ノズルの空間はなく、びっしり巻ける





Summary

- **Coil Features & Functions**
- **Round-wire Coils, Rectangular Wire Coils**
- **Thermal Issue-Key Performance Limitation**
- **Design Choices, Manufacturing Choices**



ADVANCED MOTORTECH LLC

“Motor and Generator Innovation—Taking Theory to Practice”

**4951 71st Avenue North
Pinellas Park, FL 33781-4428**

Phone: 727 - 412 - 8200

Fax: 727 - 412 – 8299

www.AdvancedMotorTech.com



***Member: SMMA, EASA, IEEE, EMERF Bd of Dir
Technical Partner: JSOL Corp., CD-Adapco
Business Partner: Powersys Ltd;***

sales@AdvancedMotorTech.com