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

Coils, sleeving, insertion

Stator sub-assembly

Wedges, tie-cord, lead wire
Stator Components--Summary
Round Wire-Random Wound Wound Coils
Rectangular Wire-Form Wound Coils

[Diagram of a wire-form wound coil]

[Image of a close-up of a wire-form wound coil]

- Slot wedge
- Slot liner
- Top coil
- Mid stick
- 5 Turn
- 4 Turn
- 3 Turn
- 2 Turn
- 1 Turn
- Bottom fill
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

Segmented & Hinged Laminations
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