

How to select the best High Voltage Coil insulation system

We have developed a comprehensive range of High Voltage Coil insulation systems, including HiFLEX, HiRES, HiBRID and HiVAX.

Insulation System:		HiBRID™	HiFLEX™	HiRES™	HiVAX™
Description		Resin rich hot pressed cell incorporating VPI accepting material applied to the coil extensions	Resin rich hot pressed cell incorporating fully cured flexible coil extensions	Resin rich hot pressed cell incorporating B stage material applied to the coil extensions	Green coil requiring full VPI impregnation
Voltage Range @ 50Hz	≤ 3,000V	✓	✓	✓	✓
	≥3,000V ≤ 6,000V	✓	✓	✓	✓
	≥ 6,600V ≤15,000V	✓	✓	✓	✓
Guaranteed Flexibility		✓	✓		✓
Full Corona Protection on Coils ≥ 6,000V		✓	✓	✓	✓
Guaranteed Storage Life Under Approved Conditions			✓		
Optional Tropical Climate Protection			✓	✓	
Guaranteed Tan δ / Tip Up Integrity		✓	✓	✓	
Thermal Performance: Class F155°C		✓	✓	✓	✓
Class F155°C		✓	✓	✓	✓
Class H180°C					✓
Class C220°C					✓
Surge Comparison or Turn To Turn Tested To 2UN+ 1000V		✓	✓	✓	✓*
AC Flash Tested To (2UN + 1000)1.2		✓	✓	✓	
Moisture Proof Capability		✓	✓	✓	✓
Oven Baking Required To Cure		✓		✓	✓
Fully Cured Before Insertion			✓		
Tested Before Dispatch		✓	✓	✓	✓

* Voltage may depend on turn insulation material and coil specification.

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Electro mechanical innovation

Insulation System:		HiBRID™
Description		Resin rich hot pressed cell incorporating VPI accepting material applied to the coil extensions
Voltage Range @ 50Hz	≤ 3,000V	✓
	≥ 3,000V ≤ 6,000V	✓
	≥ 6,600V ≤ 15,000V	✓
Guaranteed Flexibility		✓
Full Corona Protection on Coils ≥ 6,000V		✓
Guaranteed Storage Life Under Approved Conditions		
Optional Tropical Climate Protection		
Guaranteed Tan δ / Tip Up Integrity		✓
Thermal Performance: Class F155°C		✓
Class F155°C		✓
Class H180°C		
Class C220°C		
Surge Comparison or Turn To Turn Tested To 2UN+ 1000V		✓
AC Flash Tested To (2UN + 1000)1.2		✓
Moisture Proof Capability		✓
Oven Baking Required To Cure		✓
Fully Cured Before Insertion		
Tested Before Dispatch		✓



Our unique insulation system combining the merits of VPI and resin rich technology

HiBRID™ is a fully testable and flexible system pre VPI, and a fully waterproof system post VPI.

It guarantees the virtues that both VPI and resin rich technology offer, with the drawbacks of neither.

Our experience showed inherent electrical failures occurred inside the slot of VPI machines, leaving a life expectancy of roughly 5 - 6 years.

However, resin rich systems acted in reverse. The life expectancy was longer but the failures occurred in the outhang (coil extension) rather than inside the slot.

HiBRID™ comprises a hot pressed resin rich cell, scarfed into a VPI accepting outhang (coil extension), providing:

- Guaranteed slot fill
- World leading tan delta figures
- Excellent flexibility
- All coils are fully testable prior to varnishing

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Insulation System:		HiFLEX™
Description		Resin rich hot pressed cell incorporating fully cured flexible coil extensions
Voltage Range @ 50Hz	≤ 3,000V	✓
	≥3,000V ≤ 6,000V	✓
	≥ 6,600V ≤15,000V	✓
Guaranteed Flexibility		✓
Full Corona Protection on Coils ≥ 6,000V		✓
Guaranteed Storage Life Under Approved Conditions		✓
Optional Tropical Climate Protection		✓
Guaranteed Tan δ / Tip Up Integrity		✓
Thermal Performance: Class F155°C		✓
Class F155°C		✓
Class H180°C		
Class C220°C		
Surge Comparison or Turn To Turn Tested To 2UN+ 1000V		✓
AC Flash Tested To (2UN + 1000)1.2		✓
Moisture Proof Capability		✓
Oven Baking Required To Cure		
Fully Cured Before Insertion		✓
Tested Before Dispatch		✓



Our world leading, fully cured, totally flexible insulation system

HiFLEX™ is a fully cured film / mica paper / film tape with unidirectional glass to enhance mechanical characteristics, bound with an acrylic resin.

- Coils are fully tested at point of manufacture guaranteeing dielectric integrity
- Coils can then be step-down tested before being inserted and throughout the repair process
- HiFLEX™ coils are fully cured but totally flexible in the end-winding (coil extension)
- Requires no baking after winding
- Requires no varnishing or impregnation
- Guaranteed storage life - the coils are fully cured so they cannot change state in storage
- Coils are supplied in a vacuum packed, moisture proof bag inside a heavy duty wooden crate as standard
- Class F 155°C as standard > 6.6kV
- Allows total flexibility in its endwinding (coil extension), which can remain flexible for the machine's cycle
- Guaranteed flexibility of the coils, which is ideal for large two-pole windings, rewinding in situ and for skewed alternator coils

The flexibility of our HiFLEX coils makes them ideal for large two-pole windings, rewinding in situ and for skewed alternator coils. Winders also tell us they love working with HiFLEX coils. They reduce winding time as a result of improved fit and reduce process time (no baking, varnishing or impregnation) to speed up the job and minimise risk. What's more, because each coil is fully tested prior to dispatch guaranteeing dielectric integrity and comes with up to a 5 year warranty, you can complete the job with absolute confidence in the outcome.

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Insulation System:		HiRES™
Description		Resin rich hot pressed cell incorporating B stage material applied to the coil extensions
Voltage Range @ 50Hz	≤ 3,000V	✓
	≥ 3,000V ≤ 6,000V	✓
	≥ 6,600V ≤ 15,000V	✓
Guaranteed Flexibility		
Full Corona Protection on Coils ≥ 6,000V		✓
Guaranteed Storage Life Under Approved Conditions		
Optional Tropical Climate Protection		✓
Guaranteed Tan δ / Tip Up Integrity		✓
Thermal Performance: Class F155°C		✓
Class F155°C		✓
Class H180°C		
Class C220°C		
Surge Comparison or Turn To Turn Tested To 2UN+ 1000V		✓
AC Flash Tested To (2UN + 1000)1.2		✓
Moisture Proof Capability		✓
Oven Baking Required To Cure		✓
Fully Cured Before Insertion		
Tested Before Dispatch		✓



Our B-stage end winding solution

HiRES™ is our insulation system that comprises a hot-pressed B-Stage Epoxy cell scarfed into a calcined mica and B-Stage end winding (coil extension).

HiRES™ has excellent windability. However, rewinders or manufacturers in tropical areas should consider the HiFLEX™ system.

Our B-Stage cell provides the highest quality and windability

HiRES™ provides industry leading tan delta figures.

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Insulation System:		HiVAX™
Description		Green coil requiring full VPI impregnation
Voltage Range @ 50Hz	≤ 3,000V	✓
	≥ 3,000V ≤ 6,000V	✓
	≥ 6,600V ≤ 15,000V	✓
Guaranteed Flexibility		✓
Full Corona Protection on Coils ≥ 6,000V		✓
Guaranteed Storage Life Under Approved Conditions		
Optional Tropical Climate Protection		
Guaranteed Tan δ / Tip Up Integrity		
Thermal Performance:		✓
Class F155°C		✓
Class F155°C		✓
Class H180°C		✓
Class C220°C		✓
Surge Comparison or Turn To Turn Tested To 2UN+ 1000V		✓*
AC Flash Tested To (2UN + 1000)1.2		
Moisture Proof Capability		✓
Oven Baking Required To Cure		✓
Fully Cured Before Insertion		
Tested Before Dispatch		✓

* Voltage may depend on turn insulation material and coil specification.



Our unique rewinding system

HiVAX™ is our Vacuum Pressure Impregnation (VPI) insulation system.

VPI technology offers a range of benefits compared to resin rich systems, including improved sealant against moisture ingress and greater heat dissipation.

VPI technology works at higher ambient temperatures if a silicone-based resin is used for impregnation.

Resin rich technology hits a temperature plateau at Class F, whereas VPI technology has the ability to go up to a working Class C or 220°C.

HiVAX™ is ideal for AC traction windings and all machines working at high temperatures.

HiVAX™ is recommended for short lead times as there are no pressing times, so reducing the production process.

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