

PEEK Wire High Bond

Engineered For Challenging Environments

Overview-

Zeus PEEK wire high bond (HB) is the culmination of nearly a decade's worth of research and development in high voltage innovation. As a single layer solution, PEEK wire HB enables motor designers to optimize insulation thickness and improve PDIV performance over enamel wire, paving the way for next generation electric motor designs in harsh environments.

PEEK wire HB is ideally suited for motor winding applications that require tight bend radii of the wire. Our 100% PEEK single layer technology and patented extrusion processes enable superior bonding and adhesion of the PEEK coating to the underlying conductor, resulting in a wire that can be wound tortuously with a reduced risk of delamination.

PEEK wire high bond is available with insulation thicknesses ranging from 0.001" to 0.015" (0.025 mm to 0.381 mm) and in American Wire Gauge (AWG) sizes #8 to #26 as well as shaped profiles with aspect ratios < 3:1. PEEK wire HB is in-line spark tested and is 100% defect free.*



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APPLICATIONS

- Axial Flux Motors
- Radial Flux Motors
- ESP Motors
- Generators

CAPABILITIES AND SIZING

- Round: AWG #8 - #26
- Shaped: Min Height 0.054" (1.372 mm)
- Max Width 0.246" (6.248 mm)
- Spool Weights up to 500 lbs
- Thickness Range: 0.001" to 0.015" (0.025 mm to 0.381 mm)

KEY PROPERTIES

- Single Layer (100% PEEK)
- 100% Defect Free*
- Halogen Free
- Excellent Chemical Resistance

**At coating thicknesses less than 0.001" (0.025 mm), PEEK Wire HB exhibits no more than 15 spark faults per 100 feet. Between 0.001" and 0.002" (0.025 - 0.051 mm), PEEK Wire HB exhibits no more than three spark faults per 100 feet. At thicknesses > 0.002" (0.051 mm), PEEK wire HB shows no spark faults.*

Pinhole Threshold (Spark Fault Allowances)

Insulation Thickness (Single Layer)	Spark Fault Allowance
< 0.001" (< 0.025 mm)	15 Faults per 100ft Max
0.001" to 0.002" (0.025 mm to 0.051 mm)	3 Faults per 100ft Max
> 0.002" (> 0.051 mm)	No Faults allowed



DIELECTRIC STRENGTH



CHEMICAL RESISTANCE



ABRASION RESISTANCE



PEEK Wire High Bond

The tables below are representative of general product capabilities, features, and typical performance. Performance data provided below is for reference only and is not intended to be used as a specification.

FEATURES AND CAPABILITIES		
	ROUND PROFILE	SHAPED PROFILE
Insulation Material	100% PEEK	
Color	Natural (Tan)	
Size Range	AWG #8 - AWG #26	Min Height 0.054" (1.372 mm) Max Width 0.246" (6.248 mm) Max Cross Sectional Area = 0.0206" ² (13.29 mm ²)
Aspect Ratio	n/a	< 3:1
Conductor	Annealed Oxygen-Free Copper ASTM B3 Standard. Other types available as custom development	
Stripping Methods	Laser Stripping and Mechanical Abrasion	
Chemical Resistance	Excellent - PEEK chemical compatibility is well documented for harsh environments	
Coating Thickness Capabilities	0.001" to 0.015" (0.025 mm to 0.381 mm)	

ROUND CONDUCTOR SIZES			
AMERICAN WIRE GAUGE (#AWG)	DIAMETER (INCHES)	DIAMETER (MM)	CROSS SECTIONAL AREA (MM ²)
8	0.129	3.26	8.36
9	0.114	2.91	6.63
10	0.102	2.59	5.26
11	0.0907	2.30	4.17
12	0.0808	2.05	3.31
13	0.0720	1.83	2.63
14	0.0641	1.63	2.08
15	0.0571	1.45	1.65
16	0.0508	1.29	1.31
17	0.0453	1.15	1.04
18	0.0403	1.02	0.82
19	0.0359	0.91	0.65
20	0.0320	0.81	0.52
21	0.0285	0.72	0.41
22	0.0254	0.65	0.33
23	0.0226	0.57	0.26
24	0.0201	0.51	0.20
25	0.0179	0.45	0.16
26	0.0159	0.40	0.13



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PERFORMANCE		
	ROUND PROFILE	SHAPED PROFILE
Break Down Voltage ¹	AWG #25.5 (0.001" Wall) = 3.9 kV AWG #8 (0.0135" Wall) = 32 kV	0.070" x 0.124" (0.005" Wall) = 14.9 kV 0.084" x 0.246" (0.006" Wall) = 16.8 kV 0.054" x 0.131" (0.008" Wall) = 20.3 kV
PDIV ²	AWG #25.5 (0.001" Wall) = 0.6 kV AWG #8 (0.0135" Wall) = 2 kV	0.070" x 0.124" (0.005" Wall) = 1.23 kV 0.084" x 0.246" (0.006" Wall) = 1.35 kV 0.054" x 0.131" (0.008" Wall) = 1.62 kV
Windability/Bend Radius (mandrel wraps without cracks or delamination)	AWG #26 to AWG #13.5 = 3x wire diameter AWG #13 to AWG #9 = 5x wire diameter	Shaped edge bend= 4x wire width
Adhesion (elongation % without cracks or delamination)	AWG #25.5 (0.001" Wall) = up to 30% followed by 3x dia. mandrel wrap AWG #8 (0.0135" Wall) = up to 30%	0.084" x 0.246" Shaped (0.006" Wall) = up to 30%

1 - AC Dielectric breakdown testing done at room temperature with a straight sample and foil electrode

2 - PDIV testing done at room temperature on twisted pair or lashed pair samples (depending on size). 20pC sustained discharge

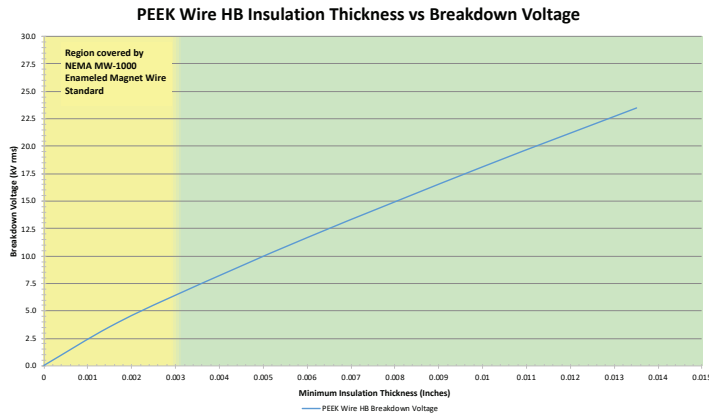


Figure 1. Due to increasing insulation thicknesses, PEEK Wire HB exhibits superior breakdown voltage over enameled wire covered by NEMA MW-1000 (yellow shaded area)

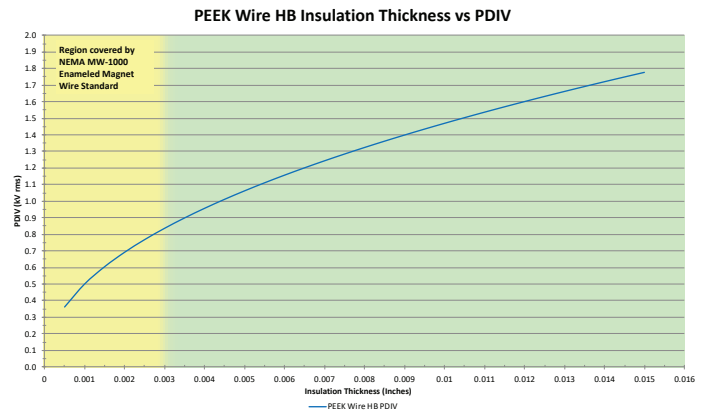


Figure 2. Due to increasing insulation thicknesses, PEEK Wire HB exhibits superior PDIV performance over enameled wire covered by NEMA MW-1000 (yellow shaded area).

