

# PEEK Insulated Wire

*Engineered For Challenging Environments*



*PEEK insulated wire drives motor performance and has shown improvements in motor Q factor, capacitance, and partial discharge.*

## Overview

Zeus PEEK insulated wire is designed specifically for challenging environments within the oil and gas, automotive, aerospace, and electrical industries. With dielectric strength of over 3,000 V/mil and a continuous service temperature of 260°C (500 °F), PEEK insulated wire offers superior abrasion resistance and the ability to withstand the intense pressure and caustic fluids found in downhole environments.

PEEK Insulated wire has a diverse range of beneficial properties, such as:

- Robustness to handle the moisture, temperature, and pressures of SAGD environments
- Customizable extrusions including rectangular and square insulated wire
- Chemically inert for use in caustic environments

PEEK insulated wire drives equipment performance in harsh environments and is utilized in electric motors, generators, transformers, solenoids, and other electromechanical equipment.



DIELECTRIC STRENGTH



CHEMICAL RESISTANCE



ABRASION RESISTANCE

## Applications

- Motors
- Generators
- Solenoids
- Transformers
- Wire harnesses

## Capabilities and Sizing

- #3 - #40 AWG sizes including ½ sizes
- Wall thickness ranging from 0.001" - 0.015" (0.025 mm - 0.381 mm)
- 100% AC spark tested during extrusion
- Amorphous or crystalline PEEK insulated wire available
- Round, stranded, square, and rectangular profiles available
- Various types of wire available, including silver and nickel-plated wire, as well as custom wire types
- Can be spliced using Zeus PEEKshrink™

## Key Properties

- Continuous operating temperature up to 500 °F (260 °C)
- Outstanding abrasion resistance
- Excellent dielectric strength
- Exceptional chemical resistance
- Corrosion protection



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<sup>1</sup>For AWG 8 with 0.008" (0.203 mm) wall thickness. insulation thickness is tested according to ASTM D374. Performance and characteristics may change based on size.

<sup>2</sup>There are no NEMA requirement values for PEEK Insulated Wire. These requirements are based off the highest temperature rated MW-16C (464 °F / 240 °C) from the NEMA MW 1000 standard. Performance and characteristics may change based on size.

<sup>3</sup>All PEEK Insulated Wire is custom ordered. Wall thicknesses available from 0.001" - 0.026" (0.025 mm - 0.660 mm) depending on the conductor size.

### <sup>1</sup> ASTM PEEK INSULATED WIRE TESTING

PROPERTIES	ASTM	UNITS	NOMINAL TEST VALUE
Resistivity Testing	B3	$\Omega$ -lb/mile <sup>2</sup>	859
Dielectric Breakdown	D149	kV RMS, at 60Hz	25
Relative Permittivity	D150		2.72
Dissipation Factor	D150	%	0.14%
DC Resistance	D257	Tn-in.	2.72

### <sup>2</sup> NEMA PEEK INSULATED WIRE TESTING

PROPERTIES	ASTM	UNITS	NOMINAL TEST VALUE
3.3 Adherence & Flexibility	No cracks visible in film coating	No cracks visible	Pass
3.5 Heat Shock	No cracks visible in film coating at 280°C	No cracks visible	Pass
3.8 Dielectric Breakdown-Twisted Pair			
» 260°C	Minimum 5,700 VAC	11,650 VAC	Pass
» Room Temperature	Minimum 5,700 VAC	12,200 VAC	Pass
3.9 Continuity	Not to exceed 10 faults	0 Faults	Pass

### <sup>3</sup> PEEK INSULATED WIRE

SIZE (AWG)	NOMINAL BARE COPPER DIAMETER	
	in.	mm
4	0.2043	5.1892
5	0.1819	4.6203
6	0.1620	4.1148
7	0.1443	3.6652
8	0.1285	3.2639
9	0.1144	2.9058
10	0.1019	2.5883
11	0.0907	2.3038
12	0.0808	2.0523
13	0.0720	1.8288
14	0.0641	1.6281
15	0.0571	1.4503
16	0.0508	1.2903
17	0.0453	1.1506
18	0.0403	1.0236
19	0.0359	0.9119
20	0.0320	0.8128
21	0.0285	0.7239
22	0.0253	0.6426
23	0.0226	0.5740
24	0.0201	0.5105
25	0.0179	0.4547
26	0.0159	0.4039
27	0.0142	0.3607
28	0.0126	0.3200
29	0.0113	0.2870
30	0.0100	0.2540
31	0.0089	0.2261
32	0.0080	0.2032
33	0.0071	0.1803
34	0.0063	0.1600
35	0.0056	0.1422
36	0.0050	0.1270
37	0.0045	0.1143
38	0.0040	0.1016
39	0.0035	0.0889
40	0.0032	0.0813