



GORE™ Magnet Wires

For Downhole
Motors in Oil & Gas
Applications

Extend motor life and increase tool reliability with durable magnet wires

The oil and gas industry faces many challenges when drilling deep into the Earth. GORE™ Magnet Wires are designed specifically to operate reliably in extreme environments, minimizing the risk of catastrophic failures for maximum tool run-times. With a unique engineered fluoropolymer insulation, these robust magnet wires provide the highest voltage endurance in a wide range of conditions, including up to high pressure, high temperature, harsh fluids and hydrolysis (Figure 1 and Tables 1 – 3).

SUPERIOR PERFORMANCE THROUGH ENDURANCE TESTING

Using ASTM/NEMA MW 1000 test method, Gore evaluated the performance of its magnet wire compared to a polyimide enameled wire. Results proved that GORE™ Magnet Wires maintained maximum voltage endurance after continuous exposure to harsh fluids at elevated temperatures which can cause hydrolysis in other materials. In contrast, the polyimide enameled wire became brittle and cracked immediately under mechanical stress, showing a substantial loss of insulation resistance and voltage breakdown performance.

GORE™ Magnet Wires provide superior performance continuously in extreme downhole environments, extending motor life and increasing tool reliability.



Benefits of GORE™ Magnet Wires

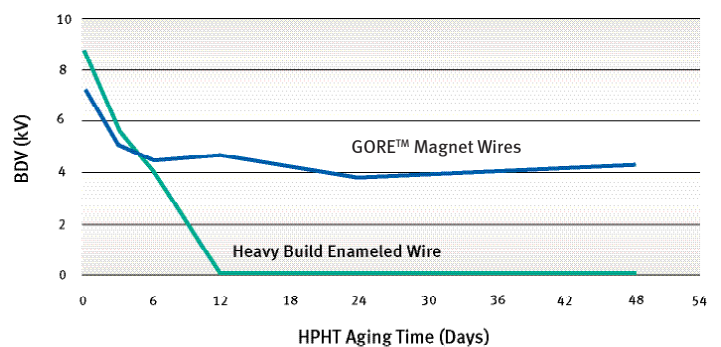
- Exceptional resistance to chemicals and hydrolysis due to specialized insulation materials
- Superior electrical performance in a wide range of temperatures up to 260°C
- Highest voltage endurance in the harshest downhole environments
- Longer motor life and increased tool reliability, reducing risk of unexpected failures

TABLE 1: WIRE PROPERTIES

Property		Value
Elec / Mech / Env	Dielectric Breakdown Voltage (kV) tested per ANSI/NEMA MW 1000 ^a	4.4
	Wire Insulation	Engineered Fluoropolymer
	Conductor	Bare Copper
	RoHS	Compliant

^aTesting based on size AWG 2801.

FIGURE 1: DIELECTRIC BREAKDOWN VOLTAGE*



* DBV tested on size AWG 28 with comparable insulation thicknesses. Performance results after 12 days exposure to hydrolysis in 0.3% H₂O and synthetic oil at 280°C (536°F).



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TABLE 2: WIRE DIMENSIONS

re Part Number	Gauge Size (AWG)	Conductor Diameter			Outer Diameter		Wall Thick. Mean (mil)	Tol. ± (mil)	Conductor Diameter			Outer Diameter		Wall Thick. Mean (µm)	Tol. ± (µm)
		Nom. (in)	Min. (in)	Max. (in)	Min. (in)	Max. (in)			Nom. (mm)	Min. (mm)	Max. (mm)	Min. (mm)	Max. (mm)		
33-61228-00	16	0.5080	0.0503	0.0513	0.0535	0.0551	1.75	0.15	1.290	1.278	1.303	1.359	1.400	44.6	3.8
33-61197-00	19	0.0359	0.0355	0.0363	0.0387	0.0401	1.75	0.15	0.912	0.902	0.922	0.983	1.019	44.6	3.8
33-61199-00	20	0.0320	0.0317	0.0323	0.0345	0.0356	1.53	0.12	0.813	0.805	0.820	0.877	0.904	38.9	3.2
33-61201-00	21	0.0285	0.0282	0.0288	0.0310	0.0321	1.53	0.12	0.724	0.716	0.732	0.788	0.816	38.9	3.2
33-61203-00	22	0.0253	0.0250	0.0256	0.0278	0.0289	1.53	0.12	0.643	0.635	0.650	0.706	0.734	38.9	3.2
33-61205-00	23	0.0226	0.0224	0.0228	0.0252	0.0261	1.53	0.12	0.574	0.569	0.579	0.640	0.663	38.9	3.2
33-61207-00	24	0.0201	0.0199	0.0203	0.0227	0.0236	1.53	0.12	0.511	0.505	0.516	0.577	0.600	38.9	3.2
33-61209-00	25	0.0179	0.0177	0.0181	0.0201	0.0209	1.30	0.12	0.455	0.450	0.460	0.510	0.532	33.0	3.0
33-61211-00	26	0.0159	0.0157	0.0161	0.0181	0.0189	1.30	0.12	0.404	0.399	0.409	0.459	0.481	33.0	3.0
33-61213-00	27	0.0142	0.0141	0.0143	0.0165	0.0171	1.30	0.12	0.361	0.358	0.363	0.418	0.435	33.0	3.0
33-61215-00	28	0.0126	0.0125	0.0127	0.0149	0.0155	1.30	0.12	0.320	0.318	0.323	0.378	0.0395	33.0	3.0
33-61217-00	29	0.0113	0.0112	0.0114	0.0136	0.0142	1.30	0.12	0.287	0.284	0.290	0.344	0.362	33.0	3.0
33-61219-00	30	0.0100	0.0099	0.0101	0.0123	0.0129	1.3	0.12	0.254	0.251	0.257	0.311	0.329	33.0	3.0
33-61221-00	31	0.0089	0.0088	0.0090	0.0107	0.0144	1.06	0.12	0.226	0.224	0.229	0.272	0.289	27.0	3.0
33-61223-00	32	0.0080	0.0079	0.0081	0.0098	0.0105	1.06	0.12	0.203	0.201	0.206	0.249	0.266	27.0	3.0

TABLE 3: WIRE SPECIFICATIONS

Gore Part Number	Gauge Size (AWG)	Spark Test Voltage (V) AC	Operating Voltage (V) AC	Operating Temperature Range	Minimum Bend Radius (mm)	DC Resistance Maximum (Ohm/km)	Twisted Pair BDV (V) AC	Breakdown Voltage (V) AC
33-61228-00	16	1500	600	-55°C to 260°C	3.5	13.4	7400	3700
33-61197-00	19	1500	600	-55°C to 260°C	3.5	27	7400	3700
33-61199-00	20	1500	500	-55°C to 260°C	3.5	34	7000	3500
33-61201-00	21	1500	500	-55°C to 260°C	3.0	43	7000	3500
33-61203-00	22	1500	500	-55°C to 260°C	3.0	54	7000	3500
33-61205-00	23	1500	500	-55°C to 260°C	3.0	67	7000	3500
33-61207-00	24	1500	500	-55°C to 260°C	2.5	87	7000	3500
33-61209-00	25	1500	400	-55°C to 260°C	2.5	110	6400	3200
33-61211-00	26	1500	400	-55°C to 260°C	2.5	138	6400	3200
33-61213-00	27	1500	400	-55°C to 260°C	2.5	174	6400	3200
33-61215-00	28	1500	400	-55°C to 260°C	2.5	218	6400	3200
33-61217-00	29	1500	400	-55°C to 260°C	2.5	271	6400	3200
33-61219-00	30	1500	400	-55°C to 260°C	2.5	347	6400	3200
33-61221-00	31	1500	300	-55°C to 260°C	2.0	439	5200	2600
33-61223-00	32	1500	300	-55°C to 260°C	2.0	545	5200	2600

ORDERING INFORMATION

For more information about GORE™ Magnet Wires or to place an order, please contact a Gore representative at gore.com/contacts.

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