<table>
<thead>
<tr>
<th>Performance Rating And Expectation</th>
<th>Best</th>
<th>Better</th>
<th>Good</th>
<th>Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner Insulation Options</td>
<td>Silicone Nylon Tape</td>
<td>Silicone Fiberglass Braid</td>
<td>Silicone Nylon Tape</td>
<td>CPE None</td>
</tr>
<tr>
<td>Available Conductor Options</td>
<td>Silicone</td>
<td>EPDM</td>
<td>EPDM</td>
<td>EPDM</td>
</tr>
<tr>
<td>Temperature Rating</td>
<td>F (252°C)</td>
<td>D (187°C)</td>
<td>D (187°C)</td>
<td>C (155°C)</td>
</tr>
<tr>
<td>Terminal Retention is improved</td>
<td>through the use of Nylon or fiberglass braid separator.</td>
<td>through the use of Nylon or fiberglass braid separator.</td>
<td>through the use of Nylon or fiberglass braid separator.</td>
<td>through the use of Nylon or fiberglass braid separator.</td>
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<tr>
<td>Wire Wound*</td>
<td>1.</td>
<td>1.</td>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td>Suppressor</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Copper Core</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
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<tr>
<td>Silicone Extrusion Core</td>
<td>4</td>
<td>4</td>
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<td>4</td>
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</tbody>
</table>

* Note: Various resistance factors Ferrite or Non-Ferrite

The demands on ignition wires are increasing as a result of higher-revving engines, higher operating temperatures, exposure to potentially damaging fuels and chemicals, increased utilization of on-board electronics, and increasing number of miles driven per year. The additional functional requirements of isolating and delivering the 30,000 – 50,000 volts required to reliably provide the spark needed for an internal combustion engine, while not creating Radio Frequency Interference (RFI), all translate to the need for a highly technical ignition wire construction.

At General Cable we are among the pioneers in the development of ignition wire technology. The technology utilized in delivering the spark for an internal combustion engine has evolved from a simple conductor to a component of a highly integrated engine management system. General Cable's vertically integrated manufacturing capabilities and vast knowledge of ignition wire manufacturing and product design technology enable our superiority in the design, manufacture and sale of bulk ignition wire.
Building a Better Ignition Wire from the Inside Out

**Ignition Wire Design**

General Cable offers two primary ignition wire constructions. Most utilize a multi-layer double extrusion design that provides better linear strength, better dielectric properties and better temperature resistance than single extrusion ignition wire. Single extrusion designs are more economical, providing a single layer of insulation over the conductor and no linear strength member.

All of General Cable's ignition wire constructions, both double and single extrusion, are available in standard Original Equipment (OE) wire diameters of 5mm, 7mm and 8mm. Custom diameters are available upon request. Typical OE production colors are black and gray, but a full range of custom jacket colors are available.

**The Conductor**

The functional requirement of the conductor is to reliably deliver a high voltage charge from the source to the spark plug, but conducting 30,000 - 50,000 volts across a low resistance conductor creates radio frequency interference (RFI). That's why General Cable offers wire wound and suppressor conductors that provide reliable delivery of energy without RFI.

Reactive wire wound (Mag Core) is a highly reliable magnetic suppression conductor with excellent heat-resistant properties. Our standard wire wound core has consistent resistive properties of 500 ohms per foot, but other specific resistive levels of wire wound cores are available for custom applications.

The most common and economical conductor is suppressor core. Utilizing non-metallic conductive materials to create a conductive yet resistive conductor, the suppressor core provides resistive qualities between 1,000 and 7,000 ohms per foot, a highly durable conductor and excellent RFI suppression. Silicone extruded core is similar in design to suppressor core, but possesses higher temperature resistance than its non-silicone counterpart.

Stranded copper core wire can also be utilized as a conductor in ignition wire constructions. However, due to the low resistive properties of copper, line resistors must be used in vehicle applications.

**The Outer Jacket**

Silicone rubber jacketed ignition wire provides superior temperature resistance and excellent gasoline, oil and antifreeze resistance. Silicone and EPDM blends are available that offer both dielectric strength and temperature resistance.

EVA outer jacket provides very good heat resistance (180°C). EVA outer insulation provides very good heat resistance (180°C - 200°C). It also provides very good gasoline, oil and antifreeze resistance and excellent tear strength.

Silicone, as an outer jacket, offers superior heat resistance (up to 250°C depending on the inner insulation). It provides excellent gasoline, oil and antifreeze resistance.

**The Inner Insulation**

EPDM inner insulation provides unbeatable dielectric strength, preventing power leaks and improving performance. However, the temperature resistance of EPDM (180°C) is inferior to EVA or Silicone constructions. EPDM is available in a variety of colors.

Ethylene Vinyl Acetate (EVA) provides better chemical and gas resistance and similar dielectric properties when compared to EPDM.

Ethylene-Propylene-Diene Monomer rubber (EPDM) provides a cost-effective outer insulation with good heat resistance (180°C). In addition, EPDM offers superior dielectric strength. Ethylene Vinyl Acetate (EVA) provides better chemical and gas resistance and similar dielectric properties when compared to EPDM.

Silicone rubber jacketed ignition wire provides superior temperature resistance and excellent gasoline, oil and antifreeze resistance. Silicone and EPDM blends are available that offer both dielectric strength and temperature resistance.

**Double Extrusion Wire**

**The Outer Jacket**

A CPE outer jacket is to be used in combination with EPDM insulation and offers good heat resistance (150°C).

**The Inner Insulation**

EPDM inner insulation provides unbeatable dielectric strength, preventing power leaks and improving performance. However, the temperature resistance of EPDM (180°C) is inferior to EVA or Silicone constructions. EPDM is available in a variety of colors.

**The Outer Jacket**

Silicone offers superior heat resistance (250°C) when used as an inner insulation or outer silicone jacket. It provides superior gasoline, oil and antifreeze resistance and good dielectric properties. Silicone material is offered in a variety of colors.

**The Strength Member**

The function of a strength member is to provide linear strength in the ignition wire construction. This strength equates to terminal retention capabilities of a terminated length of ignition wire. General Cable offers three strength member options in our double extrusion ignition wire constructions — braided, fiberglass, braid and nylon tapes.

A fiberglass braid strength member provides flexibility, linear stretch support and sheer strength for superior terminal retention. Various degrees of braiding intensity are available by varying the number of picks, or intersections, of the braid per inch on the wire.

General Cable was the first to introduce a nylon tape material as a strength member for ignition wire. Nylon tape provides unbeatable linear strength that can result in up to a 20% increase in terminal retention values when compared to fiberglass braided material product. Nylon tape aids in providing superior tear strength for the jacket material due to the high bond created between the strength member and jacket material.
The demands on ignition wires are increasing as a result of higher-revving engines, higher operating temperatures, exposure to potentially damaging fuels and chemicals, increased utilization of on-board electronics, and increasing number of miles driven per year. The additional functional requirements of isolating and delivering the 30,000 – 50,000 volts required to reliably provide the spark needed for an internal combustion engine, while not creating Radio Frequency Interference (RFI), all translate to the need for a highly technical ignition wire construction.

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