

HM Wire International, Inc.
Ph: 330-244-8501 Fax: 330-244-8561
www.litz-wire.com info@litz-wire.com www.hmwire.com

Insulation Types	Advantages	Disadvantages
FEP and PTFE	<ul style="list-style-type: none"> ● Excellent high temperature properties. PTFE is preferred for solder applications. FEP is preferred for jacket material. ● Non-flammable. ● Good outgassing characteristics. ● Most flexible of all insulations. ● Good weatherability, resists moisture absorption and atomic oxygen erosion. 	<ul style="list-style-type: none"> ● Susceptible to cold flow when stressed (bent) over tight radius or when laced too tightly. ● Degraded by solar radiation above 5×10^5 RADS. ● FEP has poor cut through resistance. ● Heaviest insulation.
ETFE	<ul style="list-style-type: none"> ● Withstands physical abuse during and after installation. ● Good high and low temperature properties. ● High flex life. ● Good outgassing characteristics. ● Fair cold flow properties. 	<ul style="list-style-type: none"> ● Some ETFE insulations fail flammability in a 30% oxygen environment. ● Insulation tends to soften at high temperature. ● Degraded by gamma radiation above 10^6 RADS.
Cross-linked ETFE	<ul style="list-style-type: none"> ● Higher strength than normal ETFE. ● Resistant to cold flow and abrasion. ● More resistant to radiation effects (to 5×10^7 RADS) ● Higher maximum temperature than normal ETFE ● Tin coating = 150°C Max. ● Silver Coating = 200°C Max. ● Good outgassing characteristics. 	<ul style="list-style-type: none"> ● Some ETFE insulations fail flammability in a 30% oxygen environment. ● Less flexible than extruded ETFE. ● More difficult to work with than PTFE.

Aromatic Polyimide	<ul style="list-style-type: none"> •Lightest weight wire insulation material. Commonly used with FEP or PTFE to form layered insulatin tapes. •Excellent physical thermal and electric properties. •Excellent cut-through resistance and cold flow resistance. •Excellent radiation resistance (to 5×10^9 RADS) •Good outgassing characteristics. 	<ul style="list-style-type: none"> •Inflexibility - difficult to strip. •Absorbs moisture. Degraded by atomic oxygen. Poor weatherability. •Prone to wet-arc and dry-arc tracking from abrasions and cuts. •More difficult to flex. •Not stable to ultraviolet radiation.
Cross-linked Polyalkene	<ul style="list-style-type: none"> •Duel extrusion which is fused by sintering. Combines excellent abrasion and cut through resistance of Polyvinylidene Fluoride (PVDF, PVF₂-Penwalt Corp. TMKynar) with Polyolefin for greater flexibility and improved heat resistance. Polyalkene is used mainly as a primary insulation under an outer jacket such as crosslinked ETFE or crosslinked PVDF/PFV₂. •High dielectric constant, used in high voltage applications. •PVDF has good radiation resistance (to 10^8 RADS) •More resistant to cold flow. •Good outgassing characteristics. 	<ul style="list-style-type: none"> •Lower maximum conductor temperature rating <ul style="list-style-type: none"> ◦(135°C for GSFC S-311-P-13) ◦(150°C for Mil-W-81044) •Reduced flexibility.
Silicon Rubber	<ul style="list-style-type: none"> •Excellent flexibility at low temperatures. •Excellent high voltage corona resistance. •Good radiation resistance (to 10^8 RADS). •Good cold flow resistance. 	<ul style="list-style-type: none"> •Poor cut through resistance, mechanical toughness, and fluid resistance. •Must be processed for outgassing control. •Flammable. •No standard silicon rubber insulated wire or cable.
INFORMATION TO BE USED AS A GUIDE ONLY.		Copyright © 2008 HM Wire International, Inc.
Information is derived from Nasa.gov		