

MV outdoor instrument transformers insulated with Hydrophobic Cycloaliphatic Epoxy (HCEP) are available to 15kV. HCEP and Automated Pressure Gelation technology are combined to create a superior product to older CEP technologies. This technology allows for a competitive product with higher quality and reliability.

GE combines superior design and advanced testing with HCEP resin and APG process technology, to produce reliable Outdoor Medium Voltage Instrument Transformers that meet IEEE C57.13 and IEEE C12.11 dimension standards.



Benefits of HCEP over CEP Insulations

. H (Hydrophobicity) = Less wetting of the surface

Allowing for:

- Lower Leakage Currents = Lower flash-over probability=Better Reliability
- Less Discharge Activity = Less erosion = improved life expectancy

Application

Designed for outdoor service; suitable for operating meters, instruments, relays and control devices.

Features:

General

- Insulation: Hydrophobic Cycloaliphatic Epoxy (HCEP)
- Baseplate: Marine grade aluminum
- . Conduit box: Cast aluminum, removable, 1" threaded hubs
- Nameplate: Anodized aluminum
- . Mounting: Horizontal, vertical, & inverted mounting options

Electrical

- Excellent dielectric properties stable in outdoor humid conditions
- Enhanced thermal cycle resistance over CEP
- High resistance to erosion from ultra violet (UV) radiation
- · High tracking and arc resistance over CEP
- · Corona and Discharge free operation
- Extended service life over CFP

Mechanical

- HCEP epoxy offers superior weatherability Ideal for outdoor applications
- Excellent water repellent characteristics
- Compact design
- Low Maintenance

Model JCK-5C

Outdoor Current Transformer 15.5 kV, 110 kV BIL, 5 to 1,200 A Range

Application

Designed for outdoor service; suitable for operating meters, instruments, relays and control devices.

Weight & Dimensions

Height: 14.55" Depth: 12.37"

Weight (Approximate).....40 lbs

Width: 10.88"

Insulation Level

15.5 kV; BIL: 110 kV per C57.13

Frequency

60 Hz

General Information

JCK-5C are manufactured in GE's Clearwater, FL. plant utilizing state-of-the-art Automated Pressure Gelation (APG) process and Hydrophobic Cycloaliphatic Epoxy (HCEP) for the entire line of outdoor current transformers. Insulation levels meet or exceed those specified in IEEE C57.13. Dimensions meet IEEE C12.11. Superior designs, HCEP epoxy, and the APG process are combined to produce the highest quality and reliability available in the industry for outdoor applications.



Unit Selection Model JCK-5C

Catalog Number	Current Ratio	Relay Class 60 Hz	Metering Class 60 Hz	Rating Factor		
Single Ratio Type JCK-5C 15 kV, 110 kV BIL						
755C152001	5:5	C40	0.3 B-0.5	3.0		
755C152002	10:5	C40	0.3 B-0.5	3.0		
755C152003	15:5	C40	0.3 B-0.5	3.0		
755C152004	20:5	C40	0.3 B-0.5	3.0		
755C152005	25:5	C40	0.3 B-0.5	3.0		
755C152006	30:5	C40	0.3 B-0.5	3.0		
755C152007	40:5	C40	0.3 B-0.5	3.0		
755C152008	50:5	C40	0.3 B-0.5	3.0		
755C152009	75:5	C40	0.3 B-0.5	3.0		
755C152010	100:5	C40	0.3 B-0.5	3.0		
755C152011	150:5	C40	0.3 B-0.5	3.0		
755C152012	200:5	C40	0.3 B-0.5	3.0		
755C152013	300:5	C40	0.3 B-0.5	3.0		
755C152014	400:5	C40	0.3 B-0.5	3.0		
755C152015	600:5	C40	0.3 B-0.5	2.0		
755C152016	800:5	C40	0.3 B-0.5	1.5		
755C152017	1,000:5	C40	0.3 B-0.5	1.2		
755C152018	1,200:5	C40	0.3 B-0.5	1.0		

General Construction

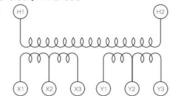
Insulation - Hydrophobic Cycloaliphatic Epoxy (HCEP) Baseplate - Heavy gage marine grade aluminum

Conduit box - Cast aluminum, removable, 1" threaded hubs

Nameplate - Anodized aluminum

Mounting - Horizontal, Vertical, Inverted

Connection Diagram



HCEP Resin Features

Ideal for outdoor applications

Excellent water repellent characteristics

High mechanical properties

Excellent dielectric properties - stable in outdoor humid conditions Enhanced thermal cycle resistance

High resistance to erosion from ultra violet (UV) radiation

High tracking and arc resistance

Extended service life

Model JCK-5CER

Outdoor Current Transformer 110 kV BIL, 2 to 1,500 A Range

Application

Designed for outdoor service; suitable for metering applications.

Weight & Dimensions

Height: 14.55"

Depth: 12.37" Width: 10.88"

Weight (Approximate).....40 lbs

Insulation Level

15.5 kV; BIL: 110 kV per C57.13

Frequency

60 Hz

General Information

JCK-5C are manufactured in ITI's Clearwater, FL. plant utilizing state of the art Automated Pressure Gelation (APG) process and Hydrophobic Cycloaliphatic Epoxy (HCEP) for the entire line of outdoor current transformers. Insulation levels meet or exceed those specified in IEEE C57.13 and CSA CAN3-C13. Dimensions meet IEEE C12.11. Superior designs, HCEP epoxy, and the APG process are combined to produce the highest quality and reliability available in the industry for outdoor applications.



Extended Range

GE's Extended Range CT guarantees high accuracy performance over a wider range than the IEEE 0.15S accuracy class, further reducing the need for multiple ratios. For many metering applications, an increase in metered revenue can be expected when using an higher accuracy CT versus a standard CT. Extended Range units are particularly ideal for applications with a highly variable current load, such as renewable energy metering.

IEEE 0.15S Metering Class: ± 0.15 % Accuracy from 5 % I_{nom} to Rating Factor

GE Extended Range: ±0.15 % Accuracy from 1% I_{nom} to Rating Factor

Unit Selection Model JCK-5CER

Catalog Number	Current Ratio	Performance Range	Metering Class*	Rating Factor @ 30 °C amb
ngle Ratio Type JCK-5C	15 kV, 110 kV BIL	60.00000 00-0000000	Dat 1990 Statement von	
755C153001	200:5	2 A to 300 A	0.15 B-1.8	1.5
755C153002	1,000:5	10 A to 1,500 A	0.15 B-1.8	1.5

General Construction

Insulation - Hydrophobic Cycloaliphatic Epoxy (HCEP)

Baseplate - Heavy gage marine grade aluminum

Conduit box - Cast aluminum, removable, 1" threaded hubs

Nameplate - Anodized aluminum

Mounting - Horizontal, Vertical, Inverted

HCEP Resin Features

Ideal for outdoor applications
Excellent water repellent characteristics
High mechanical properties
Excellent dielectric properties - stable in outdoor humid
conditions Enhanced thermal cycle resistance
High resistance to erosion from ultra violet (UV) radiation
High tracking and arc resistance
Extended service life

Notes:

- 1. 110 kV BIL, 60 Hz
- 2. Accuracy 0.15 B1.8 from 1% of rated current to its RF=1.5
- 3. Encapsulated in HCEP (hydrophobic cycloaliphatic epoxy)
- 4. HV terminals tin plated
- 5. LV terminals tin plated compression type with a 0.27 in. diameter through hole and a slotted hex head machine screw suitable for use with a 3/8 in. socket - maximum torque 50 in. lbs.
- Separate compression type ground terminal located within the LV terminal junction box.
- 7. Baseplate 0.19 in. thick marine grade aluminum.
- 8. Weight approx. 40 lbs.

Model JKW-5AC

Outdoor Current Transformer - High Accuracy 110 kV BIL, 15 kV NSV, 5 to 1200 A

Application

Designed for outdoor service; suitable for operating meters, instruments, relays and control devices.

Dimensions & Weight

Height: 14.55" Depth: 12.37" Width: 10.88"

Weight (Approximate): 66 lbs

Insulation Level

15.5 kV Maximum System Voltage; 110 kV BIL per IEEE C57.13

Frequency

60 Hz



General Information

JKW-5AC are manufactured in GE's Clearwater, FL. plant utilizing state-of-the-art Automated Pressure Gelation (APG) processes and Hydrophobic Cycloaliphatic Epoxy (HCEP) for the entire line of outdoor voltage transformers. Insulation levels meet or exceed those specified in IEEE C57.13 and CSA CAN3-C13. Dimensions meet IEEE C12.11. Superior designs, HCEP epoxy, and APG processes are combined to create a superior product. Benefits of HCEP over CEP include lower leakage currents, lower flashover probability, less discharge activity, less erosion from ultra violet (UV) radiation, enhanced thermal cycle resistance, and ultimately better reliability and improved life expectancy.

Model JKW-5C

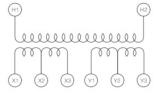
Catalog Number	Current Ratio	Relay Class 60 Hz	Metering Class 60 Hz	Rating Factor
	Single I	Ratio Type JKW-5AC 15 kV, 11	0 kV BIL	
755C151001	5:5	C200	0.15 B-0.9	1.5
755C151002	10:5	C200	0.15 B-0.9	1.5
755C151003	15:5	C200	0.15 B-0.9	1.5
755C151004	20:5	C200	0.15 B-0.9	1.5
755C151005	25:5	C200	0.15 B-0.9	1.5
755C151006	30:5	C200	0.15 B-0.9	1.5
755C151007	40:5	C200	0.15 B-0.9	1.5
755C151008	50:5	C200	0.15 B-0.9	1.5
755C151009	75:5	C200	0.15 B-0.9	1.5
755C151010	100:5	C200	0.15 B-0.9	1.5
755C151011	150:5	C200	0.15 B-0.9	1.5
755C151012	200:5	C200	0.15 B-0.9	1.5
755C151013	300:5	C200	0.15 B-0.9	1.5
755C151014	400:5	C200	0.15 B-0.9	1.5
755C151015	600:5	C200	0.15 B-0.9	1.5
755C151016	800:5	C200	0.15 B-0.9	1.33
755C151017	1,000:5	C150	0.15 B-0.9	1.33
755C151018	1,200:5	C200	0.15 B-0.9	1.1

General Construction

- Insulation Hydrophobic Cycloaliphatic Epoxy (HCEP)
- · Baseplate Heavy gage marine grade aluminum
- · Conduit box Cast aluminum, removable, 1" threaded hubs
- · Nameplate Anodized aluminum
- Mounting Horizontal, Vertical, Inverted

HCEP Resin Features

- · Ideal for outdoor applications
- Excellent water repellent characteristics
- · High mechanical properties
- Excellent dielectric properties stable in outdoor humid conditions
- Enhanced thermal cycle resistance
- High resistance to erosion from ultra violet (UV) radiation
- · High tracking and arc resistance
- Extended service life



Model JKW-5C

Outdoor Current Transformer 110 kV BIL, 5 to 1,200 A

Application

Designed for outdoor service; suitable for operating meters, instruments, relays and control devices.

Dimensions/Weight

Height: 14.55" Depth: 12.37" Width: 10.88"

Weight (Approximate): 66 lbs

Insulation Level

15.5 kV; BIL: 110 kV per C57.13

Frequency

60 Hz



General Information

JKW-5C are manufactured in ITI's Clearwater, FL. plant utilizing state of the art Automated Pressure Gelation (APG) processes and Hydrophobic Cycloaliphatic Epoxy (HCEP) for the entire line of outdoor voltage transformers. Insulation levels meet or exceed those specified in IEEE C57.13 and CSA CAN3-C13. Dimensions meet IEEE C12.11. Superior designs, HCEP epoxy, and APG processes, are combined to produce the highest quality and reliability available in the industry for outdoor applications.

Model JKW-5C

Catalog Number	Current Ratio	Relay Class 60 Hz	Metering Class 60 Hz	Rating Factor
S	ingle Ratio	Type JKW-5C 1	5 kV, 110 kV BIL	
755C150001	5:5	C200	0.3 B-1.8	1.5
755C150002	10:5	C200	0.3 B-1.8	1.5
755C150003	15:5	C200	0.3 B-1.8	1.5
755C150004	20:5	C200	0.3 B-1.8	1.5
755C150005	25:5	C200	0.3 B-1.8	1.5
755C150006	30:5	C200	0.3 B-1.8	1.5
755C150007	40:5	C200	0.3 B-1.8	1.5
755C150008	50:5	C200	0.3 B-1.8	1.5
755C150009	75:5	C200	0.3 B-1.8	1.5
755C150010	100:5	C200	0.3 B-1.8	1.5
755C150011	150:5	C200	0.3 B-1.8	1.5
755C150012	200:5	C200	0.3 B-1.8	1.5
755C150013	300:5	C200	0.3 B-1.8	1.5
755C150014	400:5	C200	0.3 B-1.8	1.5
755C150015	600:5	C200	0.3 B-1.8	1.5
755C150016	800:5	C200	0.3 B-1.8	1.33
755C150017	1,000:5	C150	0.3 B-1.8	1.33
755C150018	1,200:5	C200	0.3 B-1.8	1.5

Model JKW-5C

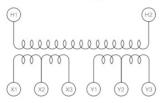
Catalog Number	Current Ratio	Relay Class 60 Hz	Metering Class 60 Hz	Rating Factor
	Dual Ratio Typ	e JKW-5C 15 k	V, 110 kV BIL	
755C150202	5/10:5	C100 / C200	0.3 B-0.9 0.3 B-1.8	2.0/1.5
755C150204	10/20:5	C100 / C200	0.3 B-0.9 0.3 B-1.8	2.0/1.5
755C150207	20/40:5	C100 / C200	0.3 B-0.9 0.3 B-1.8	2.0/1.5
755C150208	25/50:5	C100 / C200	0.3 B-0.9 0.3 B-1.8	2.0/1.5
755C150211	75/150:5	C100 / C200	0.3 B-0.9 0.3 B-1.8	2.0/1.5
755C150212	100/200:5	C100 / C200	0.3 B-0.9 0.3 B-1.8	2.0/1.5
755C150213	150/300:5	C100/C200	0.3 B-0.9 0.3 B-1.8	2.0/1.5
755C150214	200/400:5	C100 / C200	0.3 B-0.9 0.3 B-1.8	2.0/1.5
755C150215	300/600:5	C100 / C200	0.3 B-0.9 0.3 B-1.8	2.0/1.5
755C150216	400/800:5	C100 / C200	0.3 B-0.9 0.3 B-1.8	2.0/1.33
755C150218	600/1,200:5	C100 / C200	0.3 B-0.9 0.3 B-1.8	2.0/1.1

General Construction

- Insulation Hydrophobic Cycloaliphatic Epoxy (HCEP)
- · Baseplate Heavy gage marine grade aluminum
- · Conduit box Cast aluminum, removable, 1" threaded hubs
- · Nameplate Anodized aluminum
- · Mounting Horizontal, Vertical, Inverted

HCEP Resin Features

- Ideal for outdoor applications
- · Excellent water repellent characteristics
- · High mechanical properties
- Excellent dielectric properties stable in outdoor humid conditions
- · Enhanced thermal cycle resistance
- High resistance to erosion from ultra violet (UV) radiation
- High tracking and arc resistance
- Extended service life



Model JVW-110C

Outdoor Voltage Transformer 110 kV BIL. 15 kV NSV

Application

Designed for indoor service; suitable for operating meters, instruments, relays, and control devices.

Thermal Rating

30 °C Rise Above 30 °C Ambient....1,000 VA 55 °C Rise Above 50 °C Ambient......750 VA

Dimensions and Weight

Height: 15.65" Depth: 13.36" Width: 11.50"

Weight (Approximate)......62 lbs

Insulation Level

15.5 kV Maximum System Voltage; 110 kV BIL per IEEE C57.13

Frequency

60 Hz



General Information

The JVW-110C is manufactured in GE's Clearwater, FL. plant utilizing state-of-the-art Automated Pressure Gelation (APG) processes and Hydrophobic Cycloaliphatic Epoxy (HCEP) for the entire line of 15 kV outdoor voltage transformers. Insulation levels meet or exceed those specified in IEEE C57.13 and CSA CAN3-C13. Dimensions meet IEEE C12.11. Superior designs, HCEP epoxy, and APG processes are combined to create a superior product. Benefits of HCEP over CEP include lower leakage currents, lower flashover probability, less discharge activity, less erosion from ultra violet (UV) radiation, enhanced thermal cycle resistance, and ultimately better reliability and improved life expectancy.

JVW-110C

Rated Primary Voltage	Ratio	IEEE Metering Accuracy	Rated Voltage Factor	Thermal Rating (VA @ 30 °C. amb)	Catalog Number
		Single	Bushing		
7,200/12,470GY	60:1	0.3 W, X, M, Y	1.1	1,000	765C131101
7,620/13,200GY	63.5:1	0.3 W, X, M, Y	1.1	1,000	765C131102
8,400/14,560GY	70:1	0.3 W, X, M, Y	1.1	1,000	765C131103
		Double	Bushing		
7,200/12,470GY	60:1	0.3 W, X, M, Y	1.1	1,000	765C131201
7,620/13,200Y	63.5:1	0.3 W, X, M, Y	1.1	1,000	765C131202
8,400/14,560Y	70:1	0.3 W, X, M, Y	1.1	1,000	765C131203
12,000/1,2000Y	100:1	0.3 W, X, M, Y	1.1	1,000	765C131204
13,200/13,200Y	110:1	0.3 W, X, M, Y	1.1	1,000	765C131205
14,400/14,400Y	120:1	0.3 W, X, M, Y	1.1	1,000	765C131206

General Construction

- Insulation Hydrophobic Cycloaliphatic Epoxy (HCEP)
- · Baseplate Heavy gage marine grade aluminum
- Conduit box Cast aluminum, removable, 1" threaded hubs
- · Nameplate Anodized aluminum
- · Mounting Horizontal, Vertical, Inverted

HCEP Resin Features

- · Ideal for outdoor applications
- · Excellent water repellent characteristics
- · High mechanical properties
- Excellent dielectric properties stable in outdoor humid conditions
- · Enhanced thermal cycle resistance
- High resistance to erosion from ultra violet (UV) radiation
- · High tracking and arc resistance
- · Extended service life

Model JVW-5C

Outdoor Voltage Transformer 110 kV BIL, 15 kV NSV

Application

Designed for indoor service; suitable for operating meters, instruments, relays, and control devices.

Thermal Rating

1,500 VA @ 30 °C Ambient

Dimensions/Weight

Height: 16.34" Depth: 13.60" Width: 11.50"

Weight (Approximate).....80 lbs

Insulation Level

15.5 kV Maximum System Voltage; 110 kV BIL per IEEE C57.13

Frequency

60 Hz



General Information

The JVW-5C is manufactured in GE's Clearwater, FL. plant utilizing state of the art Automated Pressure Gelation (APG) processes and Hydrophobic Cycloaliphatic Epoxy (HCEP) for the entire line of outdoor voltage transformers. Insulation levels meet or exceed those specified in IEEE C57.13 and CSA CAN3-C13.

Dimensions meet IEEE C12.11. Every model has been thoroughly design tested to withstand repeated thermal shock and a modified salt fog test per IEEE standard 4. Superior designs, HCEP epoxy, and APG processes are combined to create a superior product. Benefits of HCEP over CEP include lower leakage currents, lower flashover probability, less discharge activity, less erosion from ultra violet (UV) radiation, enhanced thermal cycle resistance, and ultimately better reliability and improved life expectancy.

JVW-5C

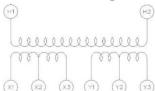
Rated Primary Voltage	Ratio	IEEE Metering Accuracy	Rated Voltage Factor	Thermal Rating (VA @ 30 °C. amb)	Catalog Number
		Single	Bushing		
7,200/12,470GY	60:1	0.3 Z, 0.6 ZZ	1.1	1,500	765C130101
7,620/13,200GY	63.5:1	0.3 Z, 0.6 ZZ	1.1	1,500	765C130102
8,400/14,560GY	70:1	0.3 Z, 0.6 ZZ	1.1	1,500	765C130103
12,000/12,000Y	100:1	0.3 Z, 0.6 ZZ	1.1	1,500	765C130104
13,200/13,200Y	110:1	0.3 Z, 0.6 ZZ	1.1	1,500	765C130105
14,400/14,400Y	120:1	0.3 Z, 0.6 ZZ	1.1	1,500	765C130106
		Double	Bushing		
7,200/12,470GY	60:1	0.3 Z, 0.6 ZZ	1.1	1,500	765C130201
7,620/13,200Y	63.5:1	0.3 Z, 0.6 ZZ	1.1	1,500	765C130202
8,400/14,560Y	70:1	0.3 Z, 0.6 ZZ	1.1	1,500	765C130203
12,000/12,000Y	100:1	0.3 Z, 0.6 ZZ	1.1	1,500	765C130204
13,200/13,200Y	110:1	0.3 Z, 0.6 ZZ	1.1	1,500	765C130205
14,400/14,400Y	120:1	0.3 Z, 0.6 ZZ	1.1	1,500	765C130206

General Construction

- Insulation Hydrophobic Cycloaliphatic Epoxy (HCEP)
- Baseplate Heavy gage marine grade aluminum
- Conduit box Cast aluminum, removable, 1" threaded hubs High mechanical properties
- Nameplate Anodized aluminum
- · Mounting Horizontal, Vertical, Inverted

HCEP Resin Features

- · Ideal for outdoor applications
- · Excellent water repellent characteristics
- Excellent dielectric properties stable in outdoor humid
- · Enhanced thermal cycle resistance
- High resistance to erosion from ultra violet (UV) radiation
- · High tracking and arc resistance
- · Extended service life



Model JVW-5AC-1

Outdoor Voltage Transformer - High Accuracy 110 kV BIL, 15 kV NSV

Application

Designed for indoor service; suitable for operating meters, instruments, relays, and control devices.

Thermal Rating

1,500 VA @ 30 °C Ambient

Dimensions/Weight

Height: 16.34" Depth: 13.60" Width: 11.50" Weight

(Approximate)......80 lbs

Insulation Level

15.5 kV Maximum System Voltage; 110 kV BIL per IEEE C57.13

Frequency

60 Hz



General Information

The JVW-5AC-1 is manufactured in GE's Clearwater, FL. plant utilizing state of the art Automated Pressure Gelation (APG) processes and Hydrophobic Cycloaliphatic Epoxy (HCEP) for the entire line of outdoor voltage transformers. Insulation levels meet or exceed those specified in IEEE C57.13 and CSA CAN3-C13.

Dimensions meet IEEE C12.11. Every model has been thoroughly design tested to withstand repeated thermal shock and a modified salt fog test per IEEE standard 4. Superior designs, HCEP epoxy, and APG processes are combined to create a superior product. Benefits of HCEP over CEP include lower leakage currents, lower flashover probability, less discharge activity, less erosion from ultra violet (UV) radiation, enhanced thermal cycle resistance, and ultimately better reliability and improved life expectancy.

JVW-5AC

Rated Primary Voltage	Ratio	IEEE Metering Accuracy	Rated Voltage Factor	Thermal Rating (VA @ 30 °C. amb)	Catalog Number
ronage		-	Bushing	(1116 00 0101110)	
7,200/12,470GY	60:1	0.15 W,X,M,Y	1.1	1,500	765C132101
7,620/13,200GY	63.5:1	0.15 W,X,M,Y	1.1	1,500	765C132102
8,400/14,560GY	70:1	0.15 W,X,M,Y	1.1	1,500	765C132103
12,000/12,000Y	100:1	0.15 W,X,M,Y	1.1	1,500	765C132104
13,200/13,200Y	110:1	0.15 W,X,M,Y	1.1	1,500	765C132105
14,400/14,400Y	120:1	0.15 W,X,M,Y	1.1	1,500	765C132106
		Double	Bushing		
7,200/12,470GY	60:1	0.15 W,X,M,Y	1.1	1,500	765C132201
7,620/13,200Y	63.5:1	0.15 W,X,M,Y	1.1	1,500	765C132202
8,400/14,560Y	70:1	0.15 W,X,M,Y	1.1	1,500	765C132203
12,000/12,000Y	100:1	0.15 W,X,M,Y	1.1	1,500	765C132204
13,200/13,200Y	110:1	0.15 W,X,M,Y	1.1	1,500	765C132205
14,400/14,400Y	120:1	0.15 W,X,M,Y	1.1	1,500	765C132206

General Construction

- Insulation Hydrophobic Cycloaliphatic Epoxy (HCEP)
- Baseplate Heavy gage marine grade aluminum
- · Conduit box Cast aluminum, removable, 1" threaded hubs
- Nameplate Anodized aluminum
- · Mounting Horizontal, Vertical, Inverted

HCEP Resin Features

- · Ideal for outdoor applications
- Excellent water repellent characteristics
- · High mechanical properties
- Excellent dielectric properties stable in outdoor humid conditions
- Enhanced thermal cycle resistance
- High resistance to erosion from ultra violet (UV) radiation
- · High tracking and arc resistance
- Extended service life

