

"We sign your cable"

## CABLE COMPOUNDS



- Termoplastic Halogen Free Flame Retardant Compounds
- CPR (EN 50575) Cable Classification Compounds
- HFFR Radiation Resistance Cable Classification Compounds
- Flame Retardant Polyethylene Compounds
- Crosslinked HFFR Compounds
- Solar Cable Compounds
- Crosslinked Polyethylene Compounds
- Crosslinked Polyolefin Compounds
- Polymer Compounds
- Additive Masterbatches
- Premix Masterbatches



CROSSLINKABLE COMPOUND			SOLAR CABLE COMPOUNDS				CROSSLINKABLE COMPOUNDS			
			KKK-451 INSULATION & SHEATHING	KKK-745 INSULATION & SHEATHING	KKK-905 INSULATION & SHEATHING	KKK-106S SHEATHING	KKK-423 INSULATION	KKK-420G INSULATION & SHEATHING	KKK-MXLPE INSULATION	KKK-XLPE INSULATION
Property	Test Method	Unit								
<b>Physical Properties</b>										
Melt Flow Rate (150°C-21,6 kg)	ASTMD 1238	g/10 min	0,25*	5,5	4	2,5	0,75**	1,3**	0,8**	0,72**
Melt Flow Rate (190°C-21,6 kg)*										
Melt Flow Rate (190°C-5 kg)**										
Density (23°C)	ASTMD-792	gr/cm <sup>3</sup>	1,19	1,37	1,48	1,50	0,935	0,89	0,94	0,933
Hardness	ASTMD2240	ShoreD	45	49	51	52	54	39	55	54
<b>Mechanical Properties</b>										
Tensile Strength	ISO 527	N/mm <sup>2</sup>	11	13	12,5	12	18	21	20	19
Elongation at Break	ISO 527	%	270	280	250	200	450	550	550	500
Heat Ageing (135 °C, 168 h)	IEC 60811-401									
Heat Ageing (135 °C, 240 h)*										
Δ Strength		%	-	+7	+6	+4	±30	<25	+5	<25*
Δ Elongation		%	-	-16	-18	-20	±30	<25	+20	<25*
Heat Ageing (150 °C-168 h)	IEC 60811-401									
Heat Ageing (150 °C-240 h)*										
Δ Strength		%	-	+8	+7	+4	±30	<25	+6*	-
Δ Elongation		%	-	-18	-20	-22	±30	<25	-5*	-
Hot Set Test (200 °C, 0,2 MPa)										
Elongation under load	IEC 60811	%	<50	<100	<100	<100	<50	-	<50	<100
Permanent elongation after cooling	IEC 60811	%	<10	<5	<5	<5	<5	-	<0	<10
Hot Set Test (250 °C, 0,2 Mpa)										
Elongation under load	IEC 60811	%	<100	<100	<100	<100	-	<100	-	-
Permanent elongation after cooling	IEC 60811	%	<10	<5	<5	<5	-	<10	-	-
Hot Pressure Test at 100 °C	IEC 60811	%	-	<50	<50	<50	-	-	-	-
Shrinkage 1h 120°C (after crosslinked)	60811-503	%	-	±2	±2	±2	-	-	-	-
Cold Elongation (-40°C±2°C)	IEC 60811-505	%	-	±30	±30	±30	-	-	-	-
<b>Chemical Properties</b>										
pH	IEC 60754-2	-	>4,3	>4,3	>4,3	>4,3	>4,3	>4,3	-	-
Conductivity	IEC 60754-2	µS/mm	<10	<10	<10	<10	<10	<10	-	-
LOI	ISO 4589	%	32	32	35	37	-	-	-	-
Smoke Density	EN-61034	% transmittance	>80	>80	>80	>80	>80	>80	-	-
Halogen Content	EN 60754-1	%	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	-	-
Dielectric Strength	ASTMD 149	Kv/mm	>20	-	-	-	22	39	32	>22
Volume Resistivity 20 °C	ASTMD257 Electrodes	PΩ.cm Ω x cm*	10	1.10 <sup>16</sup>	1.10 <sup>16</sup>	1.10 <sup>16</sup>	10	4.1 E+15	1.4 E+15*	>10
Volume Resistivity 90 °C*										

ADDITIVE MASTERBATCHES	
<b>KK-ABSORB</b>	Desiccant Masterbatch, It is a polyethylene resin based dehumidifier.
<b>KK-ABSORB15</b>	Odor Absorber Masterbatch, It is produced to eliminate bad odors without using any fragrance.
<b>KK-AOX6810</b>	Synergistic Antioxidant Masterbatch, It is a long-term thermal stabilizer.
<b>KK-AOX1024</b>	Metal Deactivator and Antioxidant Masterbatch, It is a phenolic metal deactivator that does not change color.
<b>KK-CHAR</b>	Drip Resistance Masterbatch, It is a masterbatch that improves dripping behavior and crust formation.
<b>KK-FRH</b>	Flame Retardant Masterbatch, Used in flame retardant applications.
<b>KK-FRH1</b>	Flame Retardant Synergist, It is a flame retardant synergist material for PVC applications.
<b>KK-FRHC</b>	Flame Retardant Masterbatch, It is based on a synergistic brominated flame retardant compound.
<b>KK-FRMB</b>	Flame Retardant Compound for Solar Cables, It is based on a synergistic brominated flame retardant compound.
<b>KK-FRUK</b>	Flame Retardant Masterbatch, Used in flame retardant applications.
<b>KK-IMP</b>	Mukavemet Arttırıcı Masterbatch, It is a main group of use as pulse modifier.
<b>KK-STAB44</b>	Water Repellent Masterbatch, It is often used to pass Thermal Aging tests under water conditions.
<b>KK-SV8</b>	Cracking Resistance Enhancing Masterbatch, Provides high resistance to environmental factors.
<b>KK-UV9462</b>	UV Stabilizer Masterbatch, Provides resistance to direct sunlight.
<b>KK-VHM2</b>	HM2 Masterbatch
<b>KK-VHM4</b>	HM4 Masterbatch
<b>KK-VB1</b>	CPR Masterbatch
<b>SC-CLR40P</b>	P Type Black Masterbatch, Injection molding, casting extrusion and thermoforming offer good covering power and dispersion.

POLYOLEFIN HFFR COMPOUNDS			POLYOLEFIN HFFR COMPOUNDS FOR LV, MV & HV CABLES					
			KK-SICO481	KK-SICO482	KK-SICO483	KK-SICO487	KK-SICO682	KK-SICO683
Property	Test Method	Unit						
<b>Physical Properties</b>								
Melt Flow Rate (190°C-21,6 kg)	ASTM D 1238	g/10 min	10,5*	0,9	0,7	0,9	0,4	0,5
Density (23°C)	ASTM D-792	gr/cm <sup>3</sup>	1,28	1,15	1,15	1,15	1,22	1,17
Hardness	ASTM D 2240	Shore D	51	42	48	45	54	50
Carbon Black Content	ASTM D1603	wt%	2,6	-	-	-	2,5	-
<b>Mechanical Properties</b>								
Tensile Strength	ISO 527	N/mm <sup>2</sup>	14,5	15	16	16	14	15
Elongation at Break	ISO 527	%	450	550	600	650	500	550
Heat Ageing (110 °C, 240 h)	IEC 60811							
Heat Ageing (100 °C, 168 h)*								
Δ Elongation		%	< 20	≤ 20	≤ 20*	≤ 20	≤ 25	≤ 25
Δ Retention of Tensile Elongation		%	< 20	≤ 20	≤ 20*	≤ 20	≤ 25	≤ 25
Tear Strength	ASTM D 1938	N/mm	14	15	20	15	20	20
UV Ageing	-	%	-	20	20	20	-	-
Brittleness temperature	ISO 974	°C	-	< -60	-	-	-	-
Hot Pressure Test at 90 °C	IEC 60811	%	<50	<50	<20	<50	<10**	<10**
Hot Pressure Test at 80 °C*								
Hot Pressure (Test at 110 °C, 6h)**								
Cold Flex	ISO 458-2	°C	-40±2	-40±2	-40±2	-40±2	-40±2	-40±2
Cold Bend (-35 °C±2 °C)	IEC 60811-504	-	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks
Cold Elongation (-35 °C±2 °C)	IEC 60811-505	-	30 Min.	-	-	-	-	-
Cold Impact (-35 °C±2 °C)	IEC 60811-506	-	Pass	Pass	Pass	Pass	Pass	Pass
<b>Electrical Properties</b>								
Environmental Stress Crack Resistance (50°C)	IEC 60811-406	h	>1.000	-	-	-	-	-
Halogen Content	EN 60754-1	%	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.
pH	IEC 60754-2	-	>4,3	>4,3	>4,3	>4,3	>4,3	>4,3
Conductivity	IEC 60754-2	µS/mm	<10	<10	<10	<10	<10	<10
Water Absorption	IEC 60811	mg/cm <sup>2</sup>	<5	<1	<1	<1	<1	<1
LOI	ISO 4589	%	34	28	28	29	29	29
Smoke Density	EN-61034	% transmittance	>80	>80	>80	>80	>80	>80
Volume Resistivity 20 °C	ASTM D257 Electrodes	Ω.cm PΩ.cm*	1	10*	45*	6*	17*	-
<b>Other Properties</b>								
Oil IRM 902 (70 °C, 4 h)	IEC 60811-404							
Δ Strength		%	10	10	10	10	10	10
Δ Elongation		%	9	9	9	9	9	9



HFFR INSULATING AND SHEATHING CABLE COMPOUNDS

HFFR INSULATING AND SHEATHING CABLE COMPOUND			HFFR INSULATING AND SHEATHING CABLE COMPOUNDS									HFFR INSULATING AND SHEATHING CABLE COMPOUND / FLEX				HFFR INSULATING AND SHEATHING CABLE COMPOUND/ CPR					HFFR RADIATION COMPOUNDS						
			SX-2E1	SX-2EC	SX-2P	SX-4FK	SX-4VV	SX-4EUV	SX-4E(HM4)	SX-4EC	SX-KYR	SX-FLEX10	SX-FLEX040	SX-EC081	SX-ECOUV	SX-50S	SX-4DM	SX-4CB	SX-4D1	SX-4DUV	SX-4E1	SX-4R	SX-4R1	SX-4R2	SX-4R	SX-4R1	SX-4R2
Property	Test Method	Unit																									
<b>Physical Properties</b>																											
Melt Flow Rate (150°C-21,6 kg)	ASTM D 1238	g/10 min	8,5	7	11,5	7,5	7,5	8	9	7	3	6,5	7	4	2	4	5,5	4,5	4,5	5	6,5	3,5	9,5	4,5			
Density (23°C)	ASTM D-792	gr/cm <sup>3</sup>	1,51	1,53	1,44	1,51	1,52	1,48	1,51	1,52	1,45	1,38	1,52	1,44	1,44	1,55	1,58	1,55	1,56	1,57	1,55	1,52	1,51	1,5			
Hardness	ASTM D 2240	Shore D	51	50	51	55	54	52	55	50	53	49	53	48	51	53	52	53	54	52	50	50	51	53			
<b>Mechanical Properties</b>																											
Tensile Strength	ISO 527	Mpa	13	13	13	13,5	13	13	13	12,5	18	14	12,5	14	15	12	12	12,5	12	12	12	13	12	14			
Elongation at Break	ISO 527	%	195	180	210	180	190	220	190	175	230	350	185	240	240	155	160	170	180	160	155	200	190	185			
Heat Ageing (100 °C, 168 h) Heat Ageing (110 °C, 168 h)* Heat Ageing (110 °C, 240 h)**	IEC 60811																										
Δ Strength		%	-30	-30	-30	-30*	-30*	-30*	-30*	-30	<20	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30			
Δ Elongation		%	±40	±40	±40	±40*	±40*	±40*	±40*	±40	<30	±40	±40	±40	±40	±40	±40	±40	±40	±40	±40	±40	±40	±40			
Tear Strength	ASTM D 1938	N/mm	11	5,5	7	5	6	7	5	6	9	13	5,5	10	11	4	4,5	4,5	4	4,5	5	7	5	5			
Hot Pressure Test at 80 °C	IEC 60811	%	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50			
Cold Flex	ISO 458-2	°C	-40±2	-40±2	-40±2	-40±2	-40±2	-40±2	-40±2	-40±2	-40±2	-40±2	-40±2	-40±2	-20±2	-18±2	-18±2	-18±2	-18±2	-18±2	-18±2	-20±2	-20±2	-20±2			
Cold Bend (-15 °C±2 °C)	IEC 60811-504	-	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks			
Cold Elongation (-15 °C±2 °C)	IEC 60811-505	-	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.			
Cold Impact (-15 °C±2 °C)	IEC 60811-506	-	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass			
<b>Chemical Properties</b>																											
Halogen Content	EN 60754-1	%	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	0	0	0	
pH	IEC 60754-2	-	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	>4.3	
Conductivity	IEC 60754-2	µS/mm	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
Water Absorption	IEC 60811	mg/cm <sup>2</sup>	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
LOI	ISO 4589	%	38	37	39	40	42	36	41	39	37	40	41	37	37	45	45	44	42	44	45	39	39	40			
Smoke Density	EN-61034	% transmittance	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80			
Volume Resistivity 20 °C	ASTM D257 Electrodes	Ω.cm	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>	1.10 <sup>15</sup>				
<b>Other Properties</b>																											
Oil IRM 902 (70 °C, 4 h)	IEC 60811-404																										
Δ Strength		%	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10			
Δ Elongation		%	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9			

HFFR CPR BEDDING

HFFR CPR BEDDING			HFFR-85ST	HFFR-F30	HFFR-T20	HF-EPM08	HFFR-80F
PROCESS TYPE/BASIC PRODUCT SPECIFIC			Co-extrusion Tandem	Flexible	Co-extrusion Tandem	Flexible	Flexible
Property	Test Method	Unit					
<b>Physical Properties</b>							
Melt Flow Rate (150°C-21,6 kg)	ASTM D 1238	g/10 min	75±10	160±10	4±2	80±5	70±10
Density (23°C)	ASTM D-792	gr/cm <sup>3</sup>	1,86±0,02	1,60±0,03	1,86±0,03	1,81±0,05	1,82±0,03
<b>Mechanical Properties</b>							
Tensile Strength	ISO 527	MPa		4	-	-	-
Elongation at Break	ISO 527	%		120	-	-	-
LOI	ISO 4589	%	67	48	75	>55	60
<b>Chemical Properties</b>							
Halogen Content	EN 60754-1	%	<0,5 Max.	<0,5 Max.	<0,5 Max.	0	<0,5 Max.
<b>HFFR BEDDING</b>			<b>HFFR-D3</b>	<b>HFFR-D40</b>	<b>HF-PE75</b>	<b>HF-EPR</b>	<b>HF-RS</b>
PROCESS TYPE/BASIC PRODUCT SPECIFIC			Flexible	Flexible	Tandem	Tandem	Flexible/Tandem
Property	Specification	Unit					
<b>Physical Properties</b>							
Melt Flow Rate (150°C-21,6 kg)	ASTM D 1238	gr/10 min	90±10	80±10	120±20	200±20	125±10
Melt Flow Rate (190°C-5 kg)*							
Specific Weight (23°C)	ASTM D-792	gr/cm <sup>3</sup>	1,70±0,05	1,69±0,05	1,98±0,04	1,90±0,05	1,90±0,05
<b>Mechanical Properties</b>							
Tensile Strength	ISO 527	MPa	3	6,5	-	-	-
Elongation at Break	ISO 527	%	350	360	-	-	-
LOI	ISO 4589	%	33	33	-	-	-
<b>Chemical Properties</b>							
Halogen Content	EN 60754-1	%	<0,5 Max.	<0,5 Max.	<0,5 Max.	<0,5 Max.	-
<b>SPECIAL COMPOUNDS</b>			<b>SC-FRB1</b>	<b>SC-FRA2</b>	<b>KK-F</b>	<b>SC-DBFR</b>	
PROCESS TYPE/BASIC PRODUCT SPECIFIC			AI.Composite Panel Compound	AI.Composite Panel Compound	HFFR Injection Compound	HFFR Pipe Compound	
Property	Test Method	Unit					
<b>Physical Properties</b>							
Carrier Resin	-		PE	EVA	-	-	-
Color	ASTM E 1164		Light Grey	Light Grey	-	-	-
MDH Content	-	%	80	90-92	-	-	-
MFI (150°C-21,6 kg)	ASTM D 1238	g/10 min	4±2	20±2	50±5	7	
Density	ASTM D 792	g/cm <sup>3</sup>	1,86±0,03	2,0±0,02	1,18±0,01	1,50	
LOI	ISO 4589	%	>62	-	-	53	

POLYMER COMPOUNDS			SX-8450-HB	SX-8380-HN
Property	Test Method	Unit		
<b>Physical Properties</b>				
Melt Flow Rate (190°C-2,16 kg) (190°C-5 kg)*	ASTM D 1238	g/10 min	1,8*	0,9
Density (23°C)	ASTM D-792	gr/cm <sup>3</sup>	0,948	0,948
Hardness	ASTM D 2240	Shore D	61	60
Carbon Black Content	ASTM D1603	wt%	2,5	-
<b>Mechanical Properties</b>				
Tensile Strength	ISO 527	N/mm <sup>2</sup>	33	38
Elongation at Break	ISO 527	%	1000	860
Flexural Modulus	ISO 178	Mpa	950	-
Water Absorption	ASTM D570	%	-	≤0.01
Hot Pressure Test at 110 °C	IEC 60811	%	-	<50
ESCR (F0, 50°C, 10% Igepal)	ASTM D1693	h	>5000	>5000
O.I.T at 200°C	ASTM D3895	min	-	> 100
<b>Electrical Properties</b>				
Dielectric Constant @ 1 MHz	ASTM D150	kV/mm	33.3	<2.3
Volume Resistivity @500V	ASTM D 257	Ω.cm	7.3E15	-

