



Mica Tape

For Fire Resistant Cable

PAMICA Electric Material (Hubei) Co., Ltd.

TEL: 86-715-4337388/4325020

FAX: 86-715-4354338

WEB: www.pamica.com

MAIL: sales@pamica.com



WWW.PAMICA.COM



Since foundation in 1991, PAMICA have been focusing on research and development, manufacturing and marketing of mica based insulating materials. Our market orientation devotes to quality perfection and optimized solution to customers. PAMICA always pay close attention to the industry innovative technology and dynamic market demand. Customers are united in praise and trust for its customizing products of individual requirements.

With five manufacturing factories occupied 300,000 m², PAMICA have 950 employees including approximate 100 professional technical personnel. It has annual production more than 30,000 tons including mica tape, mica paper, mica sheet, mica heating part, glass fabric and silicone resin.

PAMICA is an ISO9001 and ISO14001 certified company. Its products are approved by UL, CE, TUV and comply with RoHS, REACH directives and regulations.



Network



Partners





Firwo®-CM Calcined muscovite mica tape for fire-resistant wire & cable, a band-shaped electrical and thermal insulation material, consists of the high quality Pamica® calcined muscovite mica paper bonded to supporting materials of non-alkaline glass fabric, impregnated with high temperature resistant silicone resin.

Firwo®-CM calcined muscovite mica tape, special technology manufactured, is an idea solution for all kinds of fire resistant wires & cables. Heating the selected raw mica with high temperature improve the stability of mica tape by removing the water crystallization and impurities which affect negatively the dielectric strength and temperature resistance. Silicone resin content of Firwo®-CM mica tape is 50% more than same of normal tapes. The conductor protection layer, sinter of silicone resin together with mica under high temperature, improves the property of temperature resistance.

Due to the superior properties of temperature resistance, low fume halogen free and flexibility, Firwo®-CM mica tape is the preferable solution for marine & shipboard cable, nuclear cable, and other cables with thinner diameter.



Technical Data

Commodity	Calcined muscovite mica tape with single side glass fabric		
	FIRWO® - CM		
Item Code	CM80G32	CM100G32	CM120G32
Thickness(mm)	0.10±0.015	0.12±0.015	0.14±0.015
Total Substance(g/m ²)	135±12	158±12	181±12
Mica Content(g/m ²)	80±5	100±5	120±5
Glass Content(g/m ²)	32±3	32±3	32±3
Film Content(g/m ²)	-	-	-
Bond Content(g/m ²)	23±4	26±4	29±4
Dielectric Strength (KV/layer)	>1.2	>1.5	>1.8
Tensile Strength(N/cm)	>100	>120	>120

Comply with standard IEC60331,BS6387C,W.Z.

Standard Supply

Type	Item Code	Width (mm)	Length (m)	OD(mm)		Note	
				ID 52mm	ID 76mm		
Pads	CM80G32	6 - 1000	500	250 ~ 280	260 ~ 290	 Pads	
			1000	330 ~ 370	340 ~ 380		
	CM100G32		500	270 ~ 300	280 ~ 310	 Spools	
			1000	370 ~ 410	380 ~ 420		
			CM120G32	500	280 ~ 320		290 ~ 330
				1000	400 ~ 440		410 ~ 450
Spools	All	6 - 15	3000 ~ 30000	Core ID: 76mm OD: 280 - 300mm Core Height: 80, 120, 200mm Other dimension provided as per individual requirements			

Width less than 6mm available as per individual requirements.

Properties

- ◆ Pass IEC60331 fire resistant standard with single wrapping
- ◆ Pass BS6387CWZ fire resistant standard with double wrapping
- ◆ High speed wrapping up to 70m/min
- ◆ No fabric hairness for conductor wrapping
- ◆ Low fume halogen free
- ◆ 10000 meters continuous efficient wrapping without joint
- ◆ 20% more dielectric strength

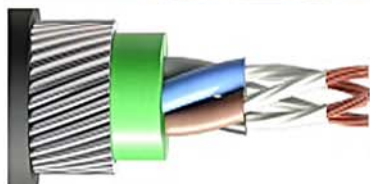




Firwo®-P phlogopite mica tape for fire-resistant wire & cable, a band-shaped electrical and thermal insulation material, consists of the high quality Pamica® phlogopite mica paper bonded to supporting materials of non-alkaline glass fabric or polyethylene film, impregnated with high temperature resistant silicone resin.



According to different supporting materials, Firwo®-P phlogopite mica tapes include below mentioned four types: Phlogopite mica tape with single side glass fabric, Phlogopite mica tape with single side PE film, Phlogopite mica tape with double sides glass fabric and Phlogopite mica tape with glass fabric and film backed. For the same thickness of different types, Phlogopite mica tape with single side glass fabric has the most excellent fire-resistant properties due to its higher mica content, but more carefully operation and better taping equipment is required.



Technical Data

Commodity	Phlogopite mica tape with double sides glass fabric		Phlogopite mica atpe with glass fabric and film backed	
	FIRWO® - PGD		FIRWO® - PGF	
Item Code	P140GD42	P160GD42	P140GF46	P160GF46
Thickness(mm)	0.14±0.015	0.17±0.015	0.14±0.015	0.16±0.015
Total Substance(g/m ²)	202±13	224±16	204±14	227±18
Mica Content(g/m ²)	140±5	160±8	140±5	160±8
Glass Content(g/m ²)	42±4	42±4	22±3	22±3
Film Content(g/m ²)	-	-	22±3	22±3
Bond Content(g/m ²)	20±4	22±4	20±3	23±4
Dielectric Strength (KV/layer)	>1.6	>2.0	>3.0	>3.0
Tensile Strength(N/cm)	>120	>120	>120	>120

Comply with standard IEC60331,BS6387C,W.Z.

Standard Supply

Type	Item Code	Width (mm)	Length (m)	OD(mm)		Note			
				ID 52mm	ID 76mm				
Pads	P80G32	6 ~ 1000	500	240 ~ 270	250 ~ 280	 Pads			
			1000	330 ~ 370	340 ~ 380				
	P100G32		500	260 ~ 290	270 ~ 300				
			1000	350 ~ 390	360 ~ 400				
	P120G32		500	270 ~ 300	280 ~ 310				
			1000	370 ~ 410	380 ~ 420				
	P160G32		500	290 ~ 320	300 ~ 330				
			1000	410 ~ 450	420 ~ 460				
	P120F25		500	250 ~ 280	260 ~ 290				
			1000	340 ~ 380	350 ~ 390				
	P160F25		500	270 ~ 310	280 ~ 320				
			1000	370 ~ 410	380 ~ 420				
	Spools		All	6 ~ 15	3000 ~ 30000		Core ID: 76mm OD: 280 ~ 300mm Core Height: 80, 120, 200mm Other dimension provided as per individual requirements.		 Spools
					P140GD42		500	280 ~ 310	
P160GD42		500			290 ~ 330	300 ~ 330			
P120GF46		500			280 ~ 310	290 ~ 320			
P140GF46		500			290 ~ 320	300 ~ 330			
P160GF46	500	310 ~ 330	320 ~ 340						

Width less than 6mm available as per individual requirements.

Technical Data

Commodity	Phlogopite mica tape with single side glass fabric				Phlogopite mica tape with single side PE film	
	FIRWO® - PG				FIRWO® - PF	
Item Code	P80G32	P100G32	P120G32	P160G32	P120F25	P160F25
Thickness(mm)	0.09±0.015	0.11±0.015	0.12±0.015	0.14±0.015	0.12±0.015	0.14±0.015
Total Substance(g/m ²)	125±11	148±11	172±11	216±14	158±11	201±14
Mica Content(g/m ²)	80±5	100±5	120±5	160±8	120±5	160±8
Glass Content(g/m ²)	32±3	32±3	32±3	32±3	-	-
Film Content(g/m ²)	-	-	-	-	25±3	25±3
Bond Content(g/m ²)	13±3	16±3	20±3	24±3	13±3	16±3
Dielectric Strength (KV/layer)	>1.0	>1.2	>1.2	>1.4	>5.0	>5.5
Tensile Strength(N/cm)	>100	>120	>120	>120	>110	>120





Firwo[®]-S synthetic mica tapes for fire-resistant wire & cable, a band-shaped electrical and thermal insulation material, consists of the high quality Pamica[®] synthetic mica paper bonded to supporting materials of non-alkaline glass fabric or polyethylene film, impregnated with high temperature resistant silicone resin.

According to different supporting materials, Firwo[®]-S synthetic mica tape include below mentioned three types: synthetic mica tape with single side glass fabric, synthetic mica tape with double sides glass fabric and synthetic mica tape with glass fabric and film backed. for the same thickness of different types, synthetic mica tape with single side glass fabric has the most excellent fire-resistant properties due to its higher mica content, but more carefully operation and better taping equipment are required.

Due to halogen Fluorine contented by synthetic mica, Firwo[®]-CM calcined muscovite mica tape is recommended to substitute synthetic mica tape for application of cables with strict requirement of halogen free.



Technical Data

Commodity	Synthetic mica tape with double sides glass fabric		Synthetic mica tape with glass fabric and film backed		
	FIRWO [®] -SGD		FIRWO [®] -SGF		
Item Code	\$140GD42	\$160GD42	\$120GF46	\$140GF46	\$160GF46
Thickness(mm)	0.14±0.015	0.17±0.015	0.14±0.015	0.16±0.015	0.17±0.015
Total Substance(g/m ²)	202±13	224±16	181±15	203±15	226±18
Mica Content(g/m ²)	140±5	160±8	120±5	140±5	160±8
Glass Content(g/m ²)	42±4	42±4	21±3	21±3	21±3
Film Content(g/m ²)	-	-	22±3	22±3	22±3
Bond Content(g/m ²)	20±4	22±4	18±4	20±4	23±4
Dielectric Strength (KV/layer)	>1.6	>2.0	>3.0	>3.0	>3.0
Tensile Strength(N/cm)	>120	>120	>120	>120	>120

Comply with standard IEC60331,BS6387C,W.Z.

Standard Supply

Type	Item Code	Width (mm)	Length (m)	OD(mm)		Note
				ID 52mm	ID 76mm	
Pads	\$80G32	6 - 1000	500	250 - 280	260 - 290	 Pads
			1000	330 - 370	340 - 380	
	\$100G32		500	260 - 290	270 - 290	
			1000	350 - 390	360 - 400	
	\$120G32		500	270 - 300	280 - 310	
			1000	370 - 410	380 - 420	
	\$140GD42		500	290 - 320	300 - 330	
			1000	430 - 470	440 - 480	
	\$160GD42		500	290 - 330	300 - 330	
			1000	490 - 530	500 - 540	
	\$120GF46		500	280 - 310	290 - 320	
			1000	410 - 450	420 - 450	
\$140GF46	500	280 - 310	290 - 320			
	1000	450 - 490	460 - 500			
\$160GF46	500	290 - 320	300 - 330			
	1000	490 - 530	500 - 540			
Spools	All	6 - 15	3000 - 30000	Core ID: 76mm OD: 280 - 300mm Core Height: 80, 120, 200mm Other dimension provided as per individual requirements		 Spools

Width less than 6mm available as per individual requirements.

Technical Data

Commodity	Synthetic mica tape with single side glass fabric		
	FIRWO [®] -SG		
Item Code	\$80G32	\$100G32	\$120G32
Thickness(mm)	0.10±0.015	0.11±0.015	0.125±0.015
Total Substance(g/m ²)	125±12	148±12	173±12
Mica Content(g/m ²)	80±5	100±5	120±5
Glass Content(g/m ²)	32±3	32±3	32±3
Film Content(g/m ²)	-	-	-
Bond Content(g/m ²)	13±4	16±4	21±4
Dielectric Strength (KV/layer)	>1.0	>1.2	>1.4
Tensile Strength(N/cm)	>100	>120	>120





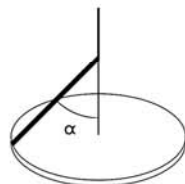
Selection of tape width

Conductor section s (mm ²)	Conductor diameter d (mm)	Width of mica tape (mm)				Overlapping ratio (%)		
		Theoretical width			Recommended width	Thickness (mm)		
		T=0.1	0.12	0.14		T=0.1	0.12	0.14
1.0	1.13	5.46	5.55	5.64	6	55	54	53
1.5	1.38	6.57	6.66	6.75	8	59	58	58
2.5	1.78	8.35	8.44	8.52	10	58	58	57
4	2.26	10.48	10.57	10.66	12	56	56	56
6	2.76	12.70	12.79	12.88	15	58	57	57
10	3.57	16.29	16.38	16.47	20	59	59	59
16	4.51	20.47	20.56	20.65	25	59	59	59

Calculation based on recommended taping angle 45° and overlapping 50%. More tape width calculation formula as below:

$$b = \pi(d+t) \frac{1}{1-k} \sin \alpha$$

- d — Conductor diameter (mm)
- t — Tape thickness (mm)
- k — Overlapping ratio (%)
- α — Taping angle (°)
- b — Tape width (mm)



Smaller taping angle increases the taping efficiency but at expense of conductor wrapping tightness which affects negatively for insulating property and extrusion. Recommended taping angle for lowest friction on tape is 45°(+/-5°).

Calculation of tape consumption per kilometer cables

$$W = \pi(d+t) \frac{G}{1-k} \times 10^{-3}$$

- d — Conductor diameter (mm)
- t — Tape thickness (mm)
- G — Tapes total substance (g/m²)
- k — Overlapping ratio (%)
- W — Tape consumption (kg)



Analysis and solutions for frequently asked questions

Item	FAQ	Analysis	Solution
1	Undesirable overlap ratio	Improper taping speed	Adjust the taping line speed
2	Tape breaks	Loose tensile force during tape slitting	Reduce properly the taping traction force
		Tightly slitting	Change another tape with new production batch number
3	Fabric hairness	Inferior quality tape	Reduce properly the taping traction force
		Deformed guide rollers	Ask quality improvements from supplier
		Improper distance of guide rollers	Change new guide roller
		Improper tape width	Adjust the height of guide rollers
		Improper tape width	Select suitable tape width

Main testing standards

Nation	Standard	Voltage	Duration	Temperature	Heating	Note
IEC	IEC 60331-31:2002	Rated Voltage; 300V	3h	≥750°C	Burner	Voltage test after 12 hours stopping fire
China	GB/T 19216.31-2008	Rated Voltage; Max 0.6/1kV	90min	A:900 – 1000°C B:750 – 840°C	Burner	None
UK	BS6387-1994	300/500V 450/750V	3h	650°C、750°C 950±40°C	Burner	One mechanical shock each 30s. and water spray during fire test
Germany	DIN VDE 0472-814-1991	Communication Cable; 110V 0.6/1kV Power Cable; 400V	3h	950±50°C	Burner	None
Japan	JIS A 1304-1994	600V	30min	840°C	Stove	Insulation resistance mini 0.4MΩ at the last 1 minute fire. voltage test 1.5kV after stopping fire lasts mini 1 minute.

Storage condition

- 1、 Two years quality guarantee period from production date, under proper storage condition with temperature ≤40°C and humidity ≤60%.
- 2、 Plastic film sealed package to avoid moisture for leftover mica tapes.