FLEXIBLE MULTILAYER INSULATIONS MADE OF NMN / NKN OR COMPOSITE CHIPBOARD

KARL SCHUPP AG

CONDUCT – PROTECT – INSULATE



We supply almost all electrically insulating films or laminates on rolls with customised widths.

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Triflexil-M Combined flexible insulating materials (2-ply)

Material:
Pressboard / Polyester

Temp. Class:
B (130°C) according to IEC 60085

Features:
Triflexil® 2.5M; double is a flexible multi-layer insulating material and temperature-resistant up to 130°.

- The material properties and test methods are defined in IEC 60626
- double combination consisting of a layer of electrical insulation film made of polyester in accordance with DIN IEC 60674 and a second layer of highly compressed roll pressboard
- Type P6.1 according to IEC 60641-1
- High dielectric strength is guaranteed by the use of an electrical insulation film made of polyester (F-PET)
- Outer layers made of pressboard are highly absorbent for impregnating and trickling resins, resulting in excellent bonding of all winding components

Dimensions:

Artikel-No.		according to IEC 60626-2 / standard climate 23/50								
		Nominal thickness	Thickness tolerance	Film thickness	Mass per unit area	Min. tensile strength unfolded		Min. elongation unfolded		Min. dielectric strength unfolded
						lengthwise	transverse	lengthwise	transverse	
		[mm]	[%]	[µm]	[g/m2]	[N/mm2]		[%]		[kV]
Slide PET 23 µm										
VSZ25M/07	*	0,07	± 15	23	80	90	60	2	8	6,5
VSZ25M/10	*	0,10	± 15	23	115	100	65	3	10	7
VSZ25M/13	*	0,13	± 15	23	165	85	60	3	10	7
VSZ25M/18	*	0,18	± 15	23	215	90	60	3	10	7
VSZ25M/20	*	0,20	± 15	23	250	90	60	5	13	8
VSZ25M/23	*	0,23	± 15	23	290	90	60	5	13	8
VSZ25M/28	*	0,28	± 15	23	350	90	60	5	13	8
VSZ25M/33	*	0,33	± 15	23	430	85	60	5	13	9
VSZ25M/40	*	0,40	± 15	23	500	90	60	5	13	9
Slide PET 36 µm										
VSZ40M/17	*	0,17	± 15	36	230	90	65	3	12	9
VSZ40M/25	*	0,25	± 15	36	310	90	60	5	13	10
VSZ40M/27	*	0,27	± 15	36	330	90	60	5	13	10
VSZ40M/30	*	0,30	± 15	36	383	90	60	5	13	10
VSZ40M/40	*	0,40	± 15	36	510	90	60	5	13	10
PET film 50 µm										
VSZ50M/10	*	0,10	± 15	50	120	100	70	3	10	10
VSZ50M/20	*	0,20	± 15	50	260	95	70	3	10	10
VSZ50M/25	*	0,25	± 15	50	320	95	60	3	10	10
VSZ50M/35	*	0,35	± 10	50	440	95	60	5	13	11

* not a stock item This information only provides general guidelines for the use of our Products

Delivery formats:	**Roles:**	**max. 1340 mm untrimmed, max. 1310 mm trimmed**
	Ribbons:	**from 4 mm width**
	Formats:	**630 x 800 mm or 800 x 1260 mm**
	Feathering:	**possible**
	Other dimensions available on request.	
Artikel-No.	**Example:**	**VSZ25M/08/022.5**
	VSZ25M/08	**= Master number**
	xxx.x	**022.5 = width 22.5 mm**

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Triflexil-M Combined flexible insulating materials (3-ply)

Material:
Pressboard / Polyester / Pressboard

Temp. Class:
B (130°C) according to IEC 60085

Features:
Triflexil® 2.5M; triple is a flexible multi-layer insulating material and temperature-resistant up to 130°C

- The material properties and test methods are defined in IEC 60626
- specialist combination consisting of: an inner layer of electrical insulation film made of polyester in accordance with DIN IEC 60674 and an outer layer each made of highly compressed roll pressboard
- Type P6.1 according to IEC 60641-1
- High dielectric strength is guaranteed by the use of an electrical insulation film made of polyester (F-PET)
- Outer layers made of pressboard are highly absorbent for impregnating and trickling resins, resulting in excellent bonding of all winding components

Dimensions:

Article-No..		IEC 60626-2 / standard climate 23/50								
		Nominal thickness	Thickness tolerance	Film thickness	Mass per unit area	Min. tensile strength unfolded		Min. elongation unfolded		Min. electrical breakdown voltage unfolded
						lengthwise	transverse	lengthwise	transverse	
		[mm]	[%]	[µm]	[g/m2]	[N/mm2]		[%]		[kV]
Folie PET 23 µm										
VSD25M/07	*	0,07	± 15	23	94	85	60	3	18	7
VSD25M/10	*	0,10	± 15	23	130	85	60	3	10	7
VSD25M/30	*	0,30	± 15	23	395	90	60	5	10	7
Folie PET 36 µm										
VSD40M/15	*	0,15	± 15	36	190	120	80	5	10	10
VSD40M/20	*	0,20	± 15	36	240	120	70	5	10	10
VSD40M/25	*	0,25	± 10	36	320	100	60	5	10	10
VSD40M/30	*	0,30	± 10	36	380	100	70	5	10	10
VSD40M/35	*	0,35	± 10	36	435	100	70	5	10	10
VSD40M/45	*	0,45	± 10	36	560	105	65	5	10	10
VSD40M/50	*	0,50	± 10	36	630	100	65	5	10	10
Folie PET 50 µm										
VSD50M/15	*	0,15	± 15	50	190	110	80	3	10	10
VSD50M/20	*	0,20	± 15	50	230	110	70	3	10	10
Folie PET 75 µm										
VSD75M/15	*	0,15	± 15	75	200	110	80	5	10	13
VSD75M/20	*	0,20	± 15	75	247	110	80	5	10	14
VSD75M/25	*	0,25	± 15	75	280	110	80	5	10	16
VSD75M/30	*	0,30	± 15	75	399	110	75	5	10	17

* not a stock item This information only provides general guidelines for the use of our Products

Delivery formats:	**Rolls:**	**max. 1340 mm untrimmed, max. 1310 mm trimmed**
	Ribbons:	**from 4 mm width**
	Formats:	**630 x 800 mm or 800 x 1260 mm**
	Feathering:	**possible**
	Other dimensions available on request.	
Artikel-No.	**Example:**	**VSD25M/07/022.5**
	VSD25M/07	**= Master number**
	xxx.x	**022.5 = width 22.5 mm**

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Triflexil-M/VL (polyester fleece/polyester film/polyester fleece)

Material:
Polyester fleece / polyester film / polyester fleece

Temp. Class:
B/F (130 °C) according to IEC 60085

Features:

- Triflexil® M/VL is a flexible multi-layer insulating material and is temperature-resistant up to 130°C
- The material properties and test methods are defined in IEC 60626
- Triple combination consisting of one layer of polyester film and one layer of polyester fleece High dielectric strength is guaranteed by the use of an electrical insulation film made of polyester (F-PET), DuPont Mylar A®
- The outer layers of polyester nonwoven fabric are very absorbent for impregnating and trickling resins, resulting in excellent bonding of all winding components
- Triflexil® M/VL can be easily punched, cut, formed and coated Smooth surface, thus good machine processability

Color:
white

Dimension:

Artikel-No.		IEC 60626-2 / standard climate 23/50								
		Nominal thickness	Thickness tolerance	Film thickness	Surface mass	Min. tensile strength unfolded		Min. elongation unfolded		Min. electrical breakdown voltage unfolded
						lengthwise	transverse	lengthwise	transverse	
		[mm]	[%]	[µm]	[g/m2]	[N/mm2]		[%]		[kV]
NIMVL12	*	0,12	± 15	23	115	85	60	25	50	5
NIMVL15	*	0,15	± 15	50	143	80	60	30	70	7
NIMVL18	*	0,18	± 15	75	190	80	80	30	70	8
NIMVL20	*	0,20	± 15	100	220	90	90	25	75	11
NIMVL23	*	0,23	± 15	125	260	90	90	25	75	14
NIMVL30	*	0,30	± 15	190	350	100	90	25	75	19
NIMVL35	*	0,35	± 10	250	425	100	90	30	80	24
NIMVL45	*	0,45	± 10	350	555	110	120	120	120	26

* not a stock item This information only provides general guidelines for the use of these Products.

Delivery formats:	Rolls:	max. 2000 mm untrimmed
	Ribbons:	from 4 mm width
	Formats:	615 x 800 mm or 800 x 1230 mm
	Other dimensions available on request.	
Artikel-No.	Example:	NIMVL23/022.5
	NIMVL23	= master number
	xxx.x	022.5 = width 22.5 mm

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Triflexil-M/VL-UE, coated (polyester fleece/polyester film/polyester fleece)

Material:
Polyester fleece coated / polyester film / polyester fleece coated

Temp. Class:

- F (155°C) according to IEC 60085
- Triflexil® M/VL-UE is a flexible multi-layer insulating material and temperature-resistant up to 155°C

Features:

- Insulation material class F (155°C) The material properties and test methods are specified in IEC 60626 Triple combination consisting of one layer of polyester film and one layer of polyester fleece coated with a temperature-resistant lacquer
- High dielectric strength is guaranteed by the use of an electrical insulation film made of polyester (F-PET), DuPont Mylar A®
- The mechanical strength is achieved by using nonwoven mats made of polyester fibers (P-PET) as outer layers.
- Triflexil® M/VL-UE can be easily punched, cut, formed and coated Smooth surface due to resin coating, thus good machine processability

Dimensions:

Artikel-No.		according to IEC 60626-2 / standard climate 23/50								
		Nominal thickness	Thickness tolerance	Film thickness	Mass per unit area	Min. tensile strength unfolded		Min. elongation unfolded		Min. dielectric strength unfolded
						lengthwise	transverse	lengthwise	transverse	
		[mm]	[%]	[µm]	[g/m2]	[N/mm2]		[%]		[kV]
NIMVLUE14	*	0,14	± 15	23	125	50	25	20	50	5
NIMVLUE16	*	0,16	± 15	50	160	75	60	20	55	7
NIMVLUE19	*	0,19	± 15	75	200	80	60	20	60	8
NIMVLUE21	*	0,21	± 15	100	230	80	60	20	60	11
NIMVLUE23	*	0,23	± 15	125	270	90	75	20	60	14
NIMVLUE31	*	0,31	± 15	190	355	100	85	20	60	19
NIMVLUE36	*	0,36	± 10	250	440	100	100	20	65	24
NIMVLUE41	*	0,41	± 10	200	505	100	100	20	60	27
NIMVLUE46	*	0,46	± 10	350	565	100	100	30	80	30

* No stock item This information only provides general guidelines for the use of our Products.

Delivery formats:	Rolls:	max. 2000 mm untrimmed
	Ribbons:	from 4 mm width
	Other dimensions available on request.	
Artikel-No.	Example:	NIMVLUE16/022.5
	NIVIMVLUE16/	= master number
	xxx.x	022.5 = width 22.5 mm

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Triflexil-NMN/50 µm (Nomex®/Mylar®/Nomex®)

Temp. Class:
F (155°C) / H (180 °C)

Features:

- Triflexil® NMN/50 is a flexible multi-layer insulating material and is temperature-resistant up to 155°C (insulating material class F), and can also be used up to 180°C (insulating material class H) when suitable impregnating resin systems are used.
- The material properties and test methods are defined in the IEC 60626 standard
- 3-fold combination consisting of one layer of polyester film according to IEC 60674 and one layer each of aramid paper (Nomex®)
- High dielectric strength is guaranteed by the use of an electrical insulation film made of polyester (F-PET), DuPont Mylar AA

Color:
cream, with yellow identification stripe

Dimensions:

Artikel-No.		according to IEC 60626-2 / standard climate 23/50									
		Nominal thickness	Thickness tolerance	Film thickness	Nomex® paper thickness	Grammage	Min. tensile strength unfolded		Min. elongation unfolded		Min. dielectric strength unfolded
							lengthwise	transverse	lengthwise	transverse	
		[mm]	[%]	[µm]	µm] [µm]	[g/m2]	[%]		[%]		[kV]
NINMN50/13	*	0,13	± 15	23	50	135	90	60	15	20	8
NINMN50/16	*	0,16	± 15	50	50	170	95	80	20	30	10
NINMN50/21	♦	0,21	± 15	100	50	240	100	100	25	40	14
NINMN50/24	*	0,24	± 15	125	50	275	100	100	25	40	15
NINMN50/30	♦	0,30	± 15	190	50	365	100	100	25	40	20
NINMN50/36	♦	0,36	± 10	250	50	450	100	100	25	35	26
NINMN50/41	*	0,41	± 10	300	50	520	100	100	25	35	27
NINMN50/46	*	0,46	± 10	350	50	590	100	100	25	35	28

♦ in wide rolls of 880 mm from stock * not a stock item, this information only provides General Information for the application of these Products.

Delivery formats:	Rolls:	max. 1830 mm untrimmed
	Ribbons:	from 4 mm width
	Formats:	600 x 800 mm or 900 x 1000 mm
	Other dimensions available on request.	
Artikel-No.	Example:	NINMN50/24/022.5
	NINMN50/24	= master number
	xxx.x	022.5 = width 22.5 mm

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Triflexil-NMN/80 µm (Nomex®/Mylar®/Nomex®)

Material:
Triflexil NMN (Nomex® 80 µm / Mylar® / Nomex® 80 µm)

Temp. Class:
F (155°C) / H (180 °C)

Features:

- Triflexil® NMN/80 is a flexible multilayer insulating material and is temperature-resistant up to 155°C (insulating material class F), and can also be used up to 180°C (insulating material class H) if suitable impregnating resin systems are used.
  The material properties and test methods are specified in IEC 60626
- 3-fold combination consisting of one layer of polyester film according to IEC 60674 and one layer each of aramid paper (DuPont Nomex®)

Color:
cream, with green identification stripe

Dimensions:

Artikel-No.		according to IEC 60626-2 / standard climate 23/50								
		Nominal thickness	Thickness tolerance	Film thickness	Mass per unit area	Tensile strength unfolded		Elongation unfolded		Min. dielectric breakdown voltage unfolded
						lengthwise	transverse	lengthwise	transverse	
		[mm]	[%]	[µm]	[g/m2]	[N/mm2]		[%]		[kV]
NINMN80/22	♦	0,22	± 15	50	220	90	80	10	20	10
NINMN80/25	*	0,25	± 15	75	255	90	80	20	25	16
NINMN80/30	♦	0,30	± 15	125	325	90	80	20	25	26
NINMN80/36	*	0,36	± 15	190	420	100	95	20	25	23
NINMN80/42	*	0,42	± 10	250	500	100	95	20	25	26
NINMN80/48	*	0,48	± 10	300	570	100	95	20	25	28

♦ in wide rolls of 880 mm from stock * not a stock item This information only provides General Information for the application of these Products.

Delivery formats:	Rolls:	max. 1830 mm untrimmed
	Ribbons:	from 4 mm width
	Formats:	600 x 900 mm or 900 x 1200 mm
	Other dimensions available on request.	
Artikel-No.	Example:	NINMN80/36/022.5
	NINMN80/36	= master number
	xxx.x	022.5 = width 22.5 mm

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Triflexil-NMN411 phase insulation (Nomex®411/polyester film/Nomex®411)

Material:
Nomex®411 / Polyester film / Nomex®411

Temp. Class:
F (155°C) / H 180 ° C)

Features:

- PUCARO Triflexil® NMN/411 is a flexible multi-layer insulating material and is temperature-resistant up to 155°C (insulating material class F), and can also be used up to 180°C (insulating material class H) when suitable impregnating resin systems are used.
- The material properties and test methods are defined in the IEC 60626 standard
- Triple combination consisting of one layer of polyester film in accordance with IEC 60674 and one layer each of uncalendered aramid paper (Nomex®411)
- High dielectric strength is guaranteed by the use of an electrical insulation film made of polyester (F-PET), DuPont Mylar A®
- Smooth surface, abrasion-resistant, therefore good machinability
- Triflexil® NMN/411 can be easily punched, cut, formed and coated
- Good absorption of impregnating and trickling resins due to the non-calendered surface
- The outer layers of Nomex® 411 give the insulation great suppleness and excellent absorbency. It is therefore ideal for use as wrapping head and phase insulation

Color:
white

Dimensions:

Artikel-No.		according to IEC 60626-2 / standard climate 23/50								
		Nominal thickness	Thickness tolerance	Film thickness	Mass per unit area	Min. tensile strength unfolded		Min. elongation unfolded		Min. electrical breakdown voltage
						lengthwise	transverse	lengthwise	transverse	
		[mm]	[%]	[µm]	[g/m2]	[N/mm2]		[%]		[kV]
NINMN411/25	*	0,25	± 20	23	135	20	20	5	15	5
NINMN411/26	*	0,26	± 20	36	155	30	25	5	20	7
NINMN411/27	♦	0,27	± 20	50	170	35	30	5	25	9
NINMN411/30	*	0,30	± 20	75	205	35	35	5	30	11
NINMN411/33	*	0,33	± 20	100	240	45	45	7	40	14
NINMN411/35	*	0,35	± 20	125	280	45	50	7	50	17

♦ in wide rolls from 900 - 930 mm from stock * not a stock item This information only provides General Information for the application of our Products.

Delivery formats:	Rolls:	max. 950 mm trimmed
	Ribbons:	from 4 mm width
	Formats:	600 x 900 mm or 900 x 1200 mm
	Other dimensions available on request.	
Artikel-No.	Example:	NINMN411/30/022.5
	NINMN411/30	= master number
	xxx.x	022.5 = width 22.5 mm

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Triflexil-NKN (Nomex®/Kapton®/Nomex®)

Material:
Nomex® / Kapton® / Nomex®

Temp. Class:
H (180 °C) / C (200 °C)

Features:

- Triflexil® NKN is a flexible multilayer insulating material and is temperature-resistant up to 180°C (insulating material class H), and can also be used up to 200°C (insulating material class C) if suitable impregnating resin systems are used.
  The material properties and test methods are specified in IEC 60626
- 3-fold combination consisting of one layer of Kapton® polyimide film according to IEC 60819 and one layer each of aramid paper (Nomex®)
- Smooth surface, abrasion-resistant, therefore good machinability
- Triflexil NKN can be easily punched, cut, formed and coated
- Low moisture absorption, good thermal and chemical resistance
- To increase the temperature resistance, a polyimide film (Kapton®) is used as the inner layer instead of a polyester film.

Color:
brownish

Dimensions:

Artikel-No.		according to IEC 60626-2 / standard climate 23/50									
		Nominal thickness	Thickness tolerance	Film thickness	Nomex® thickness	Surface mass	Min. tensile strength unfolded		Min. elongation unfolded		Min. dielectric breakdown voltage unfolded
							lengthwise	transverse	lengthwise	transverse	
		[mm]	[%]	[µm]	[µm]	[g/m2]	[N/mm2]		[%]		[kV]
Film PET 25 µm											
NINKN14	*	0,14	± 15	25	50	140	110	55	15	15	8
NINKN20	♦	0,20	± 15	25	80	190	95	55	15	15	8
NINKN25	*	0,25	± 15	25	80	235	95	55	15	15	9
NINKN30	*	0,30	± 15	25	130	290	100	60	15	15	10
NINKN40	*	0,40	± 15	25	180	410	100	70	15	15	11
NINKN55	*	0,55	± 15	25	250	540	100	70	15	15	12
Film PET 50 µm											
NINKN50/17	*	0,17	± 15	50	50	170	100	50	20	20	9
NINKN50/22	*	0,22	± 15	50	80	210	100	80	20	20	9

♦ in wide rolls of 880 mm from stock * not a stock item This information only provides General Information for the application of our Products.

Delivery formats:	**Rolls:**	**max. 965 mm untrimmed**
	Ribbons:	**from 4 mm width**
	Formats:	**600 x 900 mm or 900 x 1000 mm**
	Other dimensions available on request.	
Artikel-No.	**Example:**	**NINKN25/20/022.5**
	NINKN25/20	**= master number**
	xxx.x	**= 022.5 Width 22.5 mm**

We also supply stocked Nomex/Kapton/Nomex by the square meter!

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Triflexil-NKN411 phase insulation (Nomex®411/Kapton®/Nomex®411)

Material:
Nomex®411 / Kapton® / Nomex®411

Temp. Class:
C (200°C) according to IEC 60085

- Triflexil 2,5/NKN/411 is a flexible multilayer insulating material and temperature resistant up to 200°C
- The test procedures are defined in IEC 60626
- Insulating material for electrical engineering consisting of: an inner layer of Kapton® polyimide film and outer layers of Nomex® 411 uncalendered aramid paper
- Good absorption of impregnating resins thanks to the non-calendered Nomex 411 outer layers
- Good moldability
- It is therefore ideal as winding head and phase insulation

Color:
brownish

Dimensions:

Artikel-No.		according to IEC 60626-2 / standard climate 23/50								
		Nominal thickness	Thickness tolerance	Film thickness	Surface mass	Min. tensile strength unfolded		Min. elongation unfolded		Min. electrical breakdown voltage unfolded
						transverse	lengthwise	longitudinal	transverse	
		[mm]	[%]	[µm]	[g/m2]	[N/mm2]		[%]		[kV]
NINKN411/27	*	0,27	15	25	145	20	20	7	10	7

* no stock item
This information only provides general guidelines for the use of our Products.

Delivery formats:	Rolls:	max. 965 mm untrimmed
	Ribbons:	from 4 mm width
	Formats:	630 x 800 mm or 800 x 1260 mm
	Other dimensions available on request.	
Artikel-No.	Example:	NINKN411/27/022.5
	NINKN411/27	= master number
	xxx.x	= 022.5 Width 22.5 mm

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