POLYGLAS®

banding tapes

POLYGLAS® tapes

P30 / H200 / H220 / K220

- **Naturally strong and even better with Kevlar® inside**
- **Moisture resistant**
- **Class F, H and C tapes**

General description

Polyglas® is a trade name for a range of banding tapes consisting in parallel glass plied yarns pre-impregnated with a special thermosetting polyester PEI based resin.

Application

Polyglas® tapes are suitable for banding all kinds of motors rotors and overhangs and can be also used as a bracing tape for tying form wound coils and for locking dry or oil transformer columns.

Main Characteristics

The main advantages of Polyglas® tapes in comparison with steel wire bandages are listed as follows:

- Eddy currents proof material and locally not exposed to overheating
- Outstanding properties of breaking through fatigue
- Elimination of flashover among windings and steel bands
- Saving in insulating materials and in weight
- Saving in material costs and in process costs through reduced application time
- Resistance to corrosion in tropical environments

Polyglas® P30 is a basic class F (155 °C) banding tape, used for banding rotors, overhangs, collectors and dry and oil filled transformer.

Polyglas® H200 is a standard class H (200 °C) moisture resistant banding tape, used mainly for banding rotors and overhangs.

Polyglas® H220 is an improved class C (220 °C) moisture resistant banding tape, used mainly for banding traction rotors, collectors and overhangs.

Polyglas® K220 is the ultimate class C (220 °C) moisture resistant banding tape, Kevlar® based, used mainly for banding permanent magnets rotors, high speed starters and whenever steep operative cycles or reduced spaces are required.

Processing

By using a suitable tensioning device the tape should be applied with up to maximum suggested pull at a temperature ranging from 80 to 100 °C and at a speed around 10 m/min.
This procedure is strongly suggested for those applications in which the purpose is to obtain at least the 60% of pull as residual tension in the cured bandage.

A proper locking of tape to secure the pull applied during bandage must be performed through an hot iron or a soldering pin for a time necessary to fix the ends.

To obtain a shiny surface after curing it's suggested a masking procedure with normal or shrinkable polyester foil. It allows even a controlled flowing of the resin during curing avoiding any bubble or lump on the surface.

Curing times are related for each product to temperature applied for a certain time through following table:

Temperature in °C	Time in hours			
	P30	H200	H220	K220
160	-	2,5	3,5	3,5
150	1,5	3	5	5
135	3	5	10	10
120	5	14	24	24
115	10	20	48	48

Time required the object to reach the temperature isn't included in the table.

Once removed any masking material, the grinding operations must be strictly limited to external surface of banding and regarding a thickness of few tenths of mils.
It's strongly recommended to enquire specialised suppliers and manufacturers of tooling for boring, grinding and shaping the surface, especially when using Kevlar® based tapes.

EIM – Electrical Insulation Materials

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Main Characteristics

Characteristics as supplied		P30	H200	H220	K220	Test Norm
Thickness	mm	0.30 ± 0.03	0.30 ± 0.03	0.30 ± 0.03	0.33 ± 0.04	IEC 60371-2
Total weight	g/m^2	600 ± 60	600 ± 60	600 ± 60	600 ± 60	IEC 60371-2
Volatile content	%	0,9 ± 0,5	0,9 ± 0,5	0,9 ± 0,5	0,9 ± 0,5	ASTM D 2369-A
Resin content *	%	26 ± 2	26 ± 2	26 ± 2	26 ± 2	ASTM 2408-6.2.2
Number of yarns/cm	n	30 ± 1	30 ± 1	30 ± 1	26 ± 1	ASTM D 902
Minimal Tensile strength	N/cm	2000	2000	2000	4000	
Pull in banding	N/cm	≤1000	≤1000	≤1000	≤2000	

* content of 22% on request

Shelf life as supplied						
at 10°C	Months	24	24	24	24	before removing cool material from plastics bag let the tape reach room temperature
at 15°C	Months	18	18	18	18	
at 20°C	Months	12	12	12	12	
at 30°C	Months	8	8	8	8	

Characteristics after application and curing		P30	H200	H220	K220	Test Norm
Thermal Class	°C	155 (F)	200 (H+)	220 (C)	220 (C)	IEC 60085
Cured Thickness	mm	0.25 ± 0.02	0.25 ± 0.02	0.25 ± 0.02	0.31 ± 0.02	
Minimal Tensile Strenght referred to						
one tape layer at 20 °C	N/cm	2500	2500	2500	3500	
one tape layer at thermal class	N/cm	1800	1800	1800	2500	
Modulus of Elasticity						
at 20 °C	N/mm^2	62000	62000	62000	80000	
at thermal class	N/mm^2	50500	52000	50500	65000	
Elongation at break at 20°C	%	1,6	1,6	1,6	0,6	
Elongation at break at thermal class	%	1,4	1,4	1,4	0,5	
Breaking load at -35 °C	N/cm	2700	2700	2700	2700	
Coefficient of Linear Expansion	1/°C	6,5 E-6	6,5 E-6	6,5 E-6	6,5 E-6	
Thermal conductivity	W/(m °C)	0,53	0,53	0,53	0,53	
Radiation Index at 10^5 Gy/h		> 8	> 8	> 8	> 8	IEC 544-4
Tracking Index CTI		600	600	600	600	IEC 60112
Arc Resistance	s	180	180	180	180	ASTM D 495
Vertical Fire resistance over 12 mm		V1	V0	V0	V0	UL94
Breakdown Voltage in oil at 20 °C						
natural conditions	KV/cm	28 ± 2	28 ± 2	28 ± 2	28 ± 2	IEC 60243-1
after 24 h in water at 23 °C	KV/cm	8 ± 2	13 ± 2	13 ± 2	13 ± 2	IEC 60243-2

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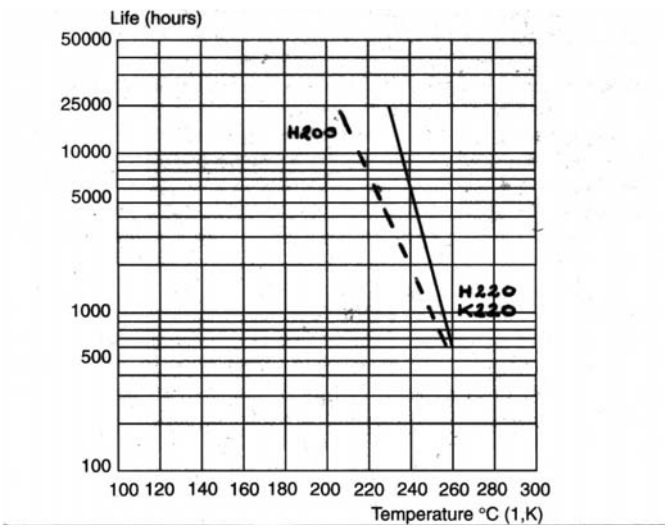
POLYGLAS® THERMAL RATING GRAPH

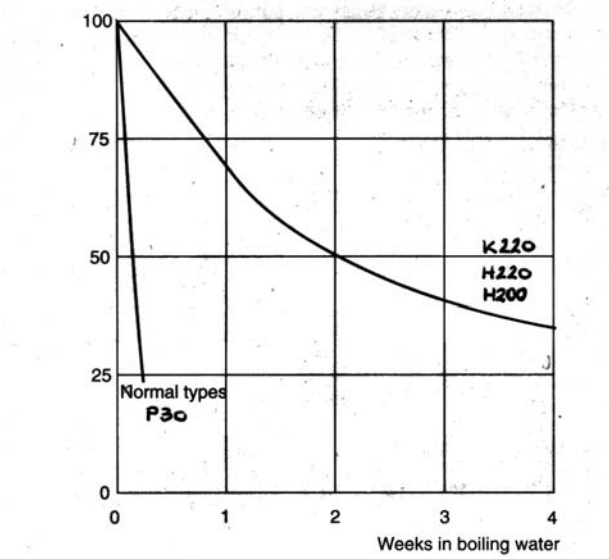
Thermal life based on changes of flexural strength
Ageing Temperatures: 220 °C, 240 °C, 260 °C
Specimen thickness of 3 mm following IEC 60216



Temperature index:
Polyglas® H200 measured at 224 °C after 5.000 h and extrapolated at 204 °C after 20.000 h
Polyglas® H220 or Polyglas® K220 measured at 242 °C after 5.000 h and extrapolated at 230 °C after 20.000 h

POLYGLAS® MOISTURE RESISTANCE

Percentage change in flexural strength after standing in boiling water (100 °C)
Specimen thickness of 3 mm following



Form of delivery

Polyglas® is normally supplied in polyethylene bags which shouldn't be tampered with until time of use.
Type A packing Flat pancakes plastic core ID 83 mm
Type B packing Spools, flange OD 160 mm, L 200 mm
Type C packing Spools, flange OD 290 mm, L 280 mm
All widths available from 4 mm to 51 mm in type A packing 100 or 200 m long and in spools as per table aside.

Width	mm	**10**	**15**	**20**	**25**	**30**
Packing	-	B	B	C	C	C
Content	m	750	500	1800	1500	1200
Net Weight	Kg	4,2	4,2	21	22	21

EIM – Electrical Insulation Materials

Liability - The information on this data sheet is to understand as guideline and has a general nature. It is not binding for VRI and it justifies in no case any liability for VRI. VRI reserves the right to change the information at any time.

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